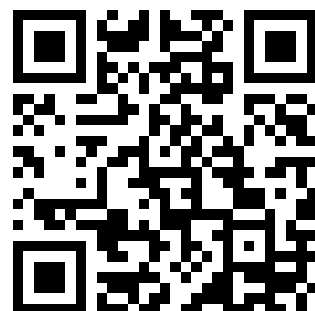

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THE IRON AGE

THURSDAY, JANUARY 3, 1889.

■ The Standard Rocking Grate Bar.

■ The Standard Rocking Grate Bar which we illustrate on this page, and which is put on the market by the National Iron Works, of New Brunswick, N. J., possesses several features of excellence.

One of the principal improvements embodied in the new bar is the use of sepa-

rate leaves or fingers, which are cast independently of the main bearing bar, as shown in the small cut. These leaves are so constructed that when in position they cover the upper edge and sides of the bearing bar, and protect the latter from the direct action of the fire, thus preventing warping. The fuel lies on the upper edge of the leaves, and, consequently, there is a current of air passing between them and over that part which covers the upper edge of the bearing bar, and this

further tends to keep the bar from becoming overheated. While the leaves when placed on the bar and fastened by the key-leaf are firmly held in their places, they can be readily removed when desired and new ones put in their places without taking the bars out of the frames. The wear, it is claimed, has been reduced to a minimum, as it all comes on the removable

are crushed between them when the bars are rocked. The fuel is agitated just enough to cause the ashes and crushed clinkers to drop into the ash-pit. This method of handling the fire renders it unnecessary to use the slice bar, as with the ordinary grate.

There are two movements to the shaking apparatus. One is a moderate movement

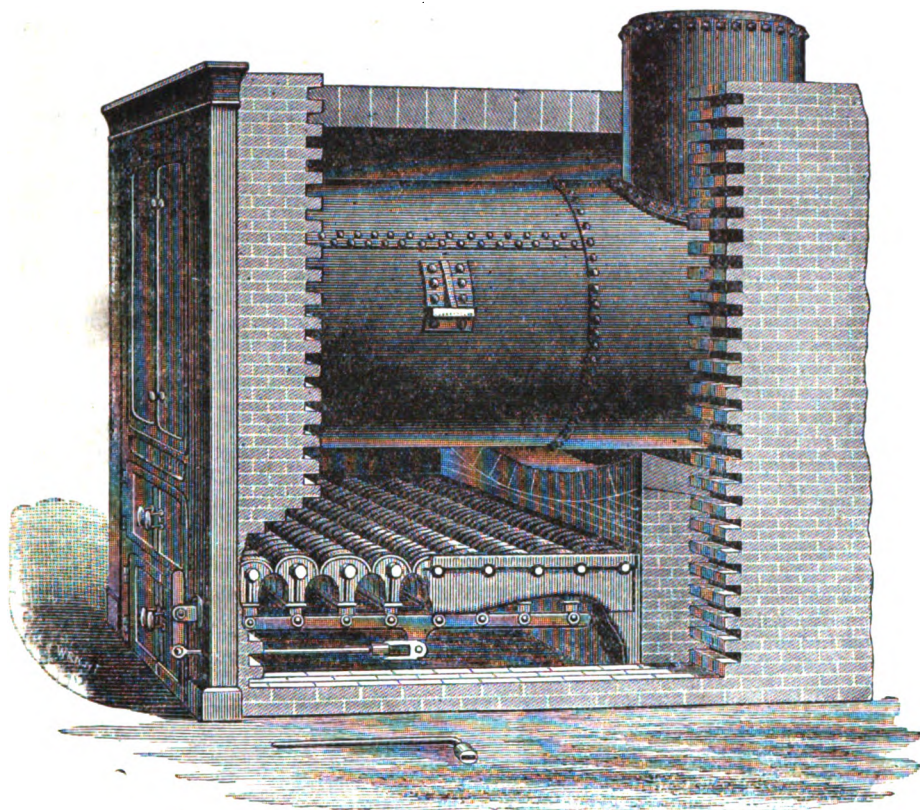


Fig. 1.—General View.

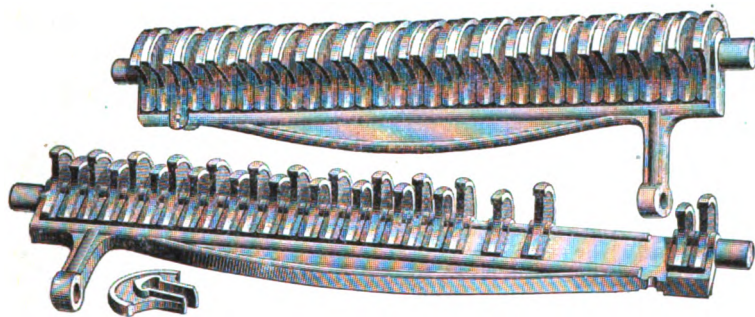


Fig. 2.—View of Single Bars, Showing Adjustment of Movable Leaves.

THE STANDARD ROCKING GRATE BAR, MADE BY THE NATIONAL IRON WORKS, NEW BRUNSWICK, N. J.

rate leaves or fingers, which are cast independently of the main bearing bar, as shown in the small cut. These leaves are so constructed that when in position they cover the upper edge and sides of the bearing bar, and protect the latter from the direct action of the fire, thus preventing warping. The fuel lies on the upper edge of the leaves, and, consequently, there is a current of air passing between them and over that part which covers the upper edge of the bearing bar, and this

leaves, which cost but a small amount in comparison with the repairs necessary where the entire bar must be replaced. By casting the leaves separately the air space can be made of any desired width and much smaller than would be practicable where the fingers are cast on the bar. The coal being supplied to the upper surface of the bed of fuel, the ashes and clinkers find their way to the bottom and come in contact with the leaves of the bars. By the peculiar shape of the leaves the clinkers

for the purpose of cleaning the fire; the second is adjusted so that the entire bed of fuel can be dumped into the ash-pit while the fire and ash-pit doors remain closed, thus confining all dust inside of the furnace. The framing on which the bars are placed is made with four standards, or legs, which rest upon the bottom of the ash-pit, and do not depend upon any part of the walls for support. No alteration is therefore necessary in the walls of any furnace in order to use these bars. The

frames are made in sections, which can be passed through the fire or ash-pit doors and be put together inside the furnace space. All that is required is a clear space inside the furnace walls.

The leaves of the Standard bar are so constructed that during the entire shaking motion the space remains the same. As a consequence no coal is wasted by dropping through the bars into the ash-pit. The bars are adapted to all kinds of fuel and will, it is claimed, work equally well on fine or large size coal, and either anthracite or bituminous.

LEGALIZING RAILWAY POOLS.

Argument by a Barb-Wire Manufacturer.

The people of Iowa have made greater efforts than the citizens of almost any other State to solve the problem of equalizing railway rates. The State is peculiarly situated, being traversed by great east and west through lines of transportation, competing for traffic at heavy business centers outside of the State, and endeavoring to make local business in the State as profitable as possible to cover losses on through business. The result of this peculiar policy has been so detrimental to Iowa manufacturers and jobbers that they naturally regard it as a discrimination against them and in favor of outside interests. The Iowa Steel Barb Wire Company, of Marshalltown, have suffered seriously from this cause, and R. E. Sears, President of the Company, is deeply interested in the attempts now being made to secure a remedy through corrective legislation. The following article from his pen, published in the *Times-Republican* of Marshalltown, is a timely contribution to the discussion of the subject, which he treats in the utmost good temper, and with a desire to see entire fairness done to all interests.

It is an accepted fact that railway legislation has come to stay, and that hereafter railway managers must recognize a higher power than their own caprice and cupidity. Discrimination as between individuals of the same locality has ceased, or at least we no longer hear complaints of it. Discrimination as to localities and States still exists and is the subject of most serious consideration. The legislation in Iowa has been the result of an overwhelming demand on the part of its people that the discriminations of the railroads against them should cease. It is a fight for self-preservation, and to any one who has studied the history of the movement and the causes leading up to it, it is manifestly unjust to charge the people of Iowa with a spirit of hostility to railroads or corporations or capital. Nowhere in our broad land are the people more conservative or more sensitive to the rights of others than are the people of Iowa. Conscientious, patient, they wish to confiscate or unjustly depreciate no one's property, nor do they intend to have their own confiscated if there is any legal relief.

Railroads, unrestrained, can make and unmake not only individuals but localities and States. Their power, unchecked, is more potent than that of the officers and legislative bodies of this country in increasing or decreasing the values of property. The very extent of the power suggests the necessity of its restriction to such limits as shall be just to all. The highest tribunal has so adjudged. The decision in the granger cases is now the law of the land and its correctness is unquestioned. The discriminations causing dissatisfaction in Iowa were in part from a desire of railway managers to have large earnings and consequently larger dividends, and perhaps, in greater part from a relentless competition at competitive points. One result of these rate wars was that frequently the railways would haul freight a certain distance for half or less of the rate

they would haul the same freight half the distance. To illustrate: They would haul a car of cattle from Council Bluffs to Chicago—500 miles—for \$25, while from Marshalltown to Chicago—300 miles—over the same line and in the same direction for the same service they would charge \$50. I merely give approximate figures.

This manifest injustice, becoming general, was the cause of that clause of the Interstate law forbidding railways to charge more for a short than for a long haul over the same line and in the same direction. The effect of that clause has been not to stop rate wars (as was anticipated) but to reduce the earnings of the roads to such an extent that many of them are on the verge of bankruptcy, and if the wars are to continue, the country is threatened in consequence with a financial panic, disastrous alike to the owners of the roads and to the public generally. The roads are the authors of their own ruin and not Iowa legislators. It is certainly not the latter, for railway managers do not pretend to have complied for a single day with the rate requirements of the law. Actuated by a reckless desire to secure business and to cripple rivals, they have engaged in a species of hari-kari, alike deadly to themselves and to their patrons.

Rate wars, as a rule, are an injury to both the roads and the public. They are an injury to the roads because they not only give the service for less than the cost, including fixed charges, but the low rates stimulate large shipments that ordinarily would not go forward for months in the future, thus reducing the business that would otherwise have been hauled at a profit to the roads, burning the candle at both ends so to speak. It is an injury to the people because it induces them (particularly the merchants and manufacturers) to over-purchase for the sake of the low rates and to suffer the financial embarrassments consequent thereto; and, with the exception of a few articles like coal and lumber, the freight is so small an item of cost that the consumer receives no appreciable benefit. For instance, how much more sugar or coffee or tea or calico does a consumer receive for a dollar when the freight is \$25 per car from Chicago to Council Bluffs in place of \$50? Rate wars are a particular injury to the farmer in the shipment of his products to market, as the low rates stimulate heavy shipments and the markets are glutted and the prices thereby seriously depressed. How often is a \$10 per car reduction in freight followed by a $\frac{1}{4}$ to a $\frac{1}{2}$ cent per pound reduction in the market price of cattle and hogs, and a proportionate reduction in cereals?

The people of Iowa demand not a ruinously low rate, followed by an exorbitantly high rate, but a reasonable, relative and uniform rate—one that will give the railways fair compensation for the service rendered and at the same time will be fair to each section of the country. The rate must be relative—that is, must be in just proportion to the services rendered and the cost of service. It is clearly unjust to charge as much for a car of freight over the same line and in the same direction for 300 miles as for 500 miles, or for 100 miles as for 300 miles. What the proportionate charge shall be can be determined largely by the relative cost of service.

How to secure such reasonable, relative and uniform rates is the problem. If rate wars from terminal or competitive points below cost continue, we certainly cannot secure relative rates. Iowa's Governor, legislators and railway commissioners, however earnest their efforts and pure their motives, cannot give us the desired relief, because at least 80 per cent. of our freight is Interstate—that is, comes from other States into Iowa, or goes from Iowa into other States, and congress alone has authority to act in such cases. To secure relative rates we must first see that reasonable and uniform rates are charged at competitive points. By uniform rates I do not mean the same rate for all classes of freight, but a permanent or stable rate, one that is not constantly fluctuating. Then it will be possible for relative rates

to follow. Without the first we can never have the second. Stability in rates is of the utmost importance in business; fluctuating rates create demoralization, and anarchy.

He who points out the way whereby reasonable rates shall be received by the railways at competitive points and be maintained has done much toward solving the problem and reconciling the interests of the people and the railways, and securing harmonious action between them. Harmony on a just basis is better for both than strife. The industries of Iowa, farming, manufacturing and jobbing, were never so prosperous as when there was a strict and strong pool at the competitive points. These relative rates were possible and equalized rates—that is, the two local rates equaling the through rate, were given. There was then a stability to rates and consequently a stability to business. If the pool was strictly adhered to, the greater the stability; if violated, the greater demoralization to business. As pooling agreements were not enforceable at law, dishonest members often violated them and thereby brought on rate wars. I know how unpopular railway pools are in the public mind and how they are prohibited by the Interstate law. They were often unfair and unreasonable in their rates. The writer does not seek to vindicate them or to apologize for their defects. He is seeking a way, if possible, out from the present discriminations from which Iowa is suffering. If our remedy is through a pool, he would not throw away the remedy merely because he did not like the name. The rose would not lose its perfume from being called by another name. The remedy would not be more efficacious if it had a more popular name. It is not the name, but the substance that we want.

Suppose that part of the Interstate law prohibiting pools was repealed and a new clause substituted legalizing railway pools and the agreements between the roads constituting the same, that the long and short haul clauses be retained with its present provisions, that equalized rates be permitted, that the reasonable rates to such competitive points shall be fixed or at least approved by the Interstate commissioners, would not such an arrangement enable us to secure reasonable and stable rates at the terminal or competitive points and relative rates at the intermediate points? And when these were secured, would there not be an end to the discriminations under which our Iowa industries have languished and in some cases perished?

Legalizing railway pools is not new. A number of such pools in England have been legalized by acts of parliament. Railway pooling agreements received the sanction of the law in Germany and Belgium and the results have proven satisfactory. By making the rates subject to the approval of the Interstate commissioners, a check to extortionate rates is given. To insure a close feeling between the commissioners and people, it might in time be considered wise to have one or more national commissioners elected from each State, the number in each State depending upon the mileage in each State, who should be elected by the people the same as members of Congress are elected.

Fowler & Sons, of Buffalo, N. Y., request us to state that they are the sole proprietors of Anderson Bolt Works, of Anderson, Md., to which we referred in our report on the Indiana Natural Gas District. They add that they make Buffalo an Eastern distributing point for the product of their works, carrying there a large stock which enables them to fill orders quickly.

A large number of the younger members of the metal trade have passed, lately, memorial resolutions of regret and appreciation relating to Arthur L. Cort, whose sudden death in San Francisco was announced recently.

Screw Making by the Cold-Rolling Process.

About a year ago we briefly described and illustrated a new wood screw which the American Screw Company, of Providence, R. I., were preparing to put on the market. The screw, as we explained at the time, was in a measure based upon the patents of Mr. H. A. Harvey, which covered the formation of screw threads by a rolling or swaging process, but which have been supplemented since their purchase by the American Screw Company by the inventions of Mr. Charles D. Rogers. The process, as finally developed and now applied, differs radically from every other screw rolling process, not excepting Harvey's, and the product represents in every respect one of the most interesting and important achievements among the many in the manufacture of wood screws. Mr. Harvey, in rolling a thread on a screw blank carried the operation through three successive stages of rolling, deepening the thread slightly in each of the three rolls, and finally devised a rolling die in which the three originally separate dies were combined, and the deepening of the threads was accomplished gradually in one machine and in practically one operation. In this way he simplified his process considerably as compared with his earlier methods, but the screws which he turned out were in no way superior to those of ordinary make, and presented no difference except possibly in point of cost. In order, however, to obtain a clear field the American Screw Company secured control of the patents, and then, through Mr. Rogers, developed a new system, retaining the fundamental idea of producing a thread by rolling, but attaining the end in an entirely new way, and turning out a screw which appears to be superior in several respects to the well-known wood screw now on the market.

Through the courtesy of the company we are enabled to present in this issue engravings of the rolling machine which they use, and of which the manner of working will be understood with little difficulty. Before entering upon a description of the machine and process, however, it may be interesting to briefly review the ordinary processes of screw making as now practiced. To these we referred in a recent issue, but will repeat here that the wire rods which are used, and which are to a great extent imported, are first cleaned and drawn into wire of desired gauge for the different sizes, or rather diameters, of screws to be turned out. This wire on reels is next fed into what are known as heading machines, in which the screw blanks are partially formed, a proper length of wire for a screw being cut off and a head being formed by one or more blows from a heading hammer. The partially finished blanks having been rattled in sawdust, to remove the oil used in the heading operation, are then taken to the shaving and slotting machine. The process to which they are subjected there consists in shaving the head of the rough blank on top and around the countersink—that is, the side of the head; then the slot is cut by means of a saw. This makes re-shaving of the head necessary, as small burrs would otherwise be left on each side of the slot. The operation is entirely automatic, the blanks being fed along a slide, gripped, presented to the shaving and slotting tools and released one after another. The finished blanks are now taken to the threading machine. In this also the entire operation is automatic. The blanks pass along a slide, one by one, in the same way, are properly gripped and presented horizontally to a cutting tool

secured in a movable tool block. This has the necessary amount of longitudinal feed to give the desired pitch to the thread, and has a quick return motion, several cuts being taken before a finished thread is secured. Soda-water is used as a lubricant. The finished screws are here also dropped into a receptacle underneath the machine, and are then ready for cleaning, packing and shipment.

In the new process of manufacture the work of preparing the blanks before threading has been greatly simplified, all the operations being performed in the heading machine and no trimming or shaving of the heads being necessary. Aside from this the object to be attained in the heading machine is the production of finished heads of a larger size relatively to the wire from which the screw is formed than has been common heretofore. These several objects involve the use of solid dies which present no seams on the surfaces on which the screw heads are to be formed, since the marks of such seams would show on the surfaces of the heads. The use of three hammers also is made necessary, since the desired large head can be obtained only from an increased amount of metal. This means an increase in the length of wire to be upset, and such an increased length renders the wire more liable to "cripple," or bend under the action of a single hammer blow, or even of two, in such a manner as to make it impossible to produce either the symmetrical form required or a sound and strong head. The exact way in which the blanks, and more particularly the heads, are formed will become clear from the three small engravings shown in Fig. 19. The partially formed blanks are there arranged in the order in which they are turned out. We will suppose a reel of wire being fed into the heading machine. The proper length for a screw-blank being gripped in the dies, the first hammer blow partially upsets the projecting end, as in *a*. The collar thus formed more readily induces the flow of metal in the desired direction, and the second blow produces the shape *b*; the third completes the head and forms also the slot for the screw-driver. The fourth operation, finally, consists in cutting off the blank from the wire coil, and this corresponds practically with swaging the points. We have not shown the complete finished blank, as its appearance can readily be imagined. The slot in the head, we should here explain, is formed by a tongue extending from the face of the hammer, which finishes the head. This tongue is forced into the metal in advance of the action of the flat surface of the hammer upon the metal, and forms an obstacle to the flow of the metal from one side of the die to the other. It is important, therefore, that the metal, before this hammer acts upon it, shall be distributed symmetrically with reference to the slot upon the two sides of the die. Again, it is obvious that the tongue, as it is forced into the metal, must spread the metal laterally; but at the ends of the tongue it does not force the metal freely toward the surface of the die, but has a tendency to carry it downward, so as to produce an imperfect face at the ends of the slot. This tendency shows itself most decidedly in making the heads, as in this case, of a larger diameter across the face than has been commonly practiced heretofore, and explains why the blank after the second blow has a head formed as in *b*. It will be noticed there that the upper surface of the partially formed head is convex along one diameter, and it is in the line of this diameter that the slot is formed. There is, accordingly, ample metal at the parts adjoining the ends of the slot to admit of a good deal of stretching without tearing. The height and width of the convex portion will vary with the size of the screw-heads and the depth and width of the slot, and

also with the character of the metal. The simplicity and directness of the whole operation, which is carried out in one machine, as compared with the repeated handling of the incomplete blanks in the old method of shaving, trimming and nicking the heads is striking. It is noteworthy also that the metal is worked cold. The blanks, as they drop from the dies in the heading machine are complete in every way, though before being threaded they undergo rattling. The rattlers, as no doubt most of our readers know, are revolving boxes, and ordinarily are used for giving articles put in them a rough finish. In this case, however, they contain sawdust, which to some extent absorbs the oil with which the blanks are covered.

Of the machine which is employed for rolling the threads on the blanks, we give a large number of details besides the two general views on the plate. The operation, however, is, in the main, simple and can be followed with little difficulty. Taken altogether the machine offers an interesting illustration of what can be done by automatic mechanism. All that the attendant has to do, one being sufficient for several machines, is to dump the screw blanks into the receptacle at the top, marked H, in Fig. 2; the finished screws drop out underneath into the box shown in the side elevation. Those of our readers who remember the engravings which we published a year ago of the Simonds metal rolling machine, in which screws also could be turned out, will find in the present apparatus an apparent similarity, owing to the fact that reciprocating dies also are employed. It should be noted, however, that in this machine all the work is performed on cold, not hot, metal and the principle of forming the screw threads, moreover, is entirely different. That this is so will presently be seen. Perhaps the best idea of the construction and function of the machine can be gained by following a screw blank from the hopper through the different operations until it emerges as a finished screw. The blanks then are, as we have already said, dumped into this hopper (H in Fig. 2) as they come from the rattlers. Within the hopper is fitted a narrow double blade, *m*, Fig. 1, which moves up and down through the mass of blanks. Its upper edge is formed at an angle, so that as the blade arrives at the end of its upward movement any blanks it may have picked up will readily slide from it on to the track T, through an opening formed in the hopper and coinciding with the track. Motion is imparted to the blade or "pick-up" through the medium of a vertically guided rack, *m*², Fig. 2, which meshes into a small gear-wheel, *m*³, loosely mounted on a horizontal shaft, *s*. This shaft has a gear-wheel, *m*¹, secured to its inner end, which gears with rack-teeth, *m*, Figs. 2 and 3, formed on the upper face of the rack-connection, *d*². Practically it is found desirable to be able at times to prevent the "pick-up" from delivering the blanks. Therefore, the gear *m*² is loosely mounted, and is provided with lugs arranged to interlock with the clutch and nut, *n*. The clutch is splined to the shaft, and is adapted to slide endwise, as common to locking devices of this character. The way in which the rack connection, as we have termed the part *d*², is driven, will be understood from Figs. 1 and 2. Power, it will be noted, is transmitted to the machine through a belt and the pulley shown in the plan. Mounted on the other end of the pulley shaft is a pinion gearing into a larger spur-wheel which, as Fig. 1 shows, drives a cross-head, B, through a connecting rod, *c*. To this cross-head, near its lower side, is secured a strong, guided connection, *c*², having rack teeth formed in its inner vertical face. This connection is well supported and guided at its forward end by the extension *g*, formed in

shaped piece, a^4 (Fig. 4), is placed at, and forms a backing to, the seat h . It is worked by a nut and screw on the end as shown.

Referring to Figs. 1, 2 and 3, it will be noticed that a rack-rod, s^1 , is fitted into the upper part of the frame at the rear side. The front portion of this rod is provided with gear-teeth on its under side, which engage teeth s^1 cut into the shaft s (see Fig. 2). By this arrangement it is evident that a reduced reciprocating move-

cam plates F (Fig. 11). A slot, f^3 , is cut through to receive the previously mentioned pin u . Two slots, f^4 , are formed transversely in the plate C and communicate with a T-shaped groove seen in the section at the right in Fig. 9. This groove is formed in the under side of the plate and serves the purpose of retaining the blank-holding jaws shown in Figs. 5 and 6, marked e , in the latter figure. Gibs e^3 secured to the plate, prevent the jaws from

The plate F is provided with three cam-shaped slots, f, f', f'' (Fig. 11), cut through it, the first named slot being adapted to receive the pin u of the rack-rod s^1 . The other two, which are shorter and are arranged right and left, are adapted to receive the pins e^4 of the jaws e . It is obvious now that by placing the plate F in the planed-out portion of the cap-plate C, and also mounting the jaws in position beneath the latter plate, a longitudinal

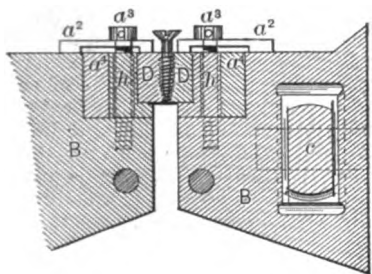


Fig. 8.—Section of Dies and Holders.

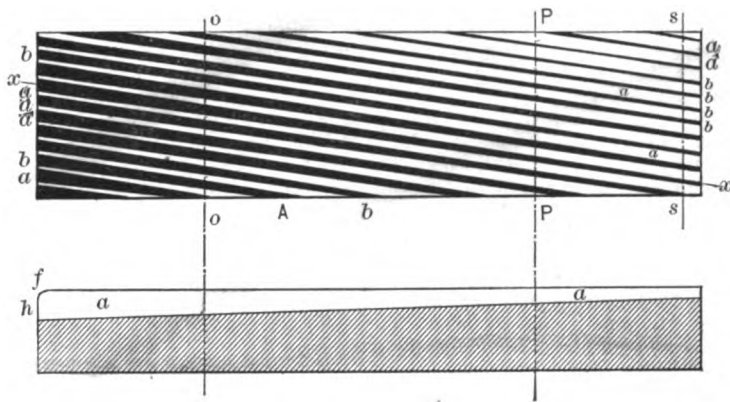


Fig. 14.—Plan and Section of One Die for Rolling Threads.

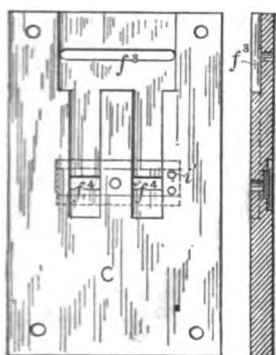


Fig. 9.—Details of Cross Plate C.

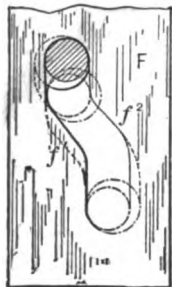


Fig. 12.—Enlarged View of Part of Cam Plate.

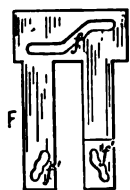


Fig. 11.—Plan of Cam Plates.

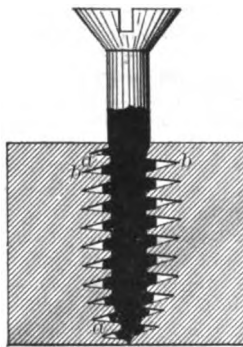


Fig. 15.—Cross Section of Dies and Screws at o o, Fig. 14.

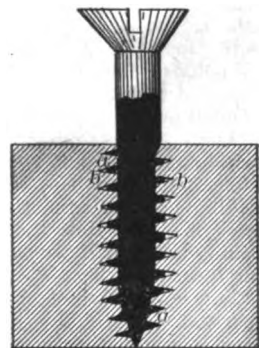


Fig. 16.—Section Along p p, Fig. 14.

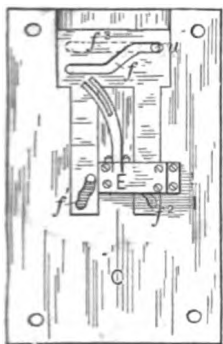


Fig. 10.—Plan of Checking Device for Blanks.

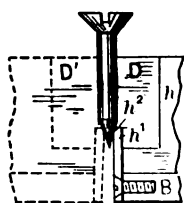


Fig. 13.—Manner of Supporting Blanks Between the Dies.

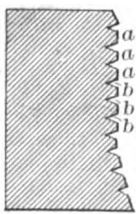


Fig. 17.—Section Along s s, Fig. 14.

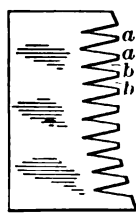


Fig. 18.—End of Die where Rolling Begins.



Fig. 19.—Upper Ends of Screw Blanks in Different Stages of Heading.

MACHINE FOR COLD-ROLLING OF SCREWS, AT WORKS OF THE AMERICAN SCREW CO., PROVIDENCE, R. I.

ment is imparted to the rod s^1 in unison with the cross-head. An elongated opening, u^1 (Fig. 1), is formed in the center portion of the rear gib-plate, a^1 , through which a pin, u , secured to the rear end of the rod s^1 , projects. The object of this rod and attachments is to actuate the blank-checking and holding devices which we shall presently describe. A plate, C (Fig. 3), firmly unites the two sides of the frame, being bolted to them. Its center is directly over the center of the space formed by the separation of the dies when in their extreme position. Its upper surface is recessed as shown in Fig. 9 to receive the

dropping out, although permitting them to travel back and forth, as in opening and closing when combined with the cam-plate F. The jaws are each provided with a short pin, e^4 (Fig. 5), which passes through the openings, f^4 . The adjacent vertical faces of the jaws are cut out in a semi-circular form, k (Fig. 6), and are countersunk at the bottom, so as to freely receive the headed blanks. The jaws are reduced in thickness at the lower portion, as at e^1 , so that they may easily enter the space formed by the lateral separation of the dies, the edges being concave to more readily retain the blanks in position.

movement of the pin u , extending through the straight slots u^1, f^3 and into the cam-slot f (see Fig. 10), will cause the plate F to move back and forth across the machine a distance corresponding to the throw of the cam. At the same time, by reason of the engagement of the pins e^4 with the cam-slots f^1 , the jaws will be made to open and close, the distance traveled being governed, of course, by the offset of the cam. A portion of one of the arms of the cam-plate F extends above the general surface of the plate, and is provided with an additional cam-slot, f^2 (Fig. 12). This cam-slot is substantially of the same length

as the lower slot f^1 , as clearly shown by the full lines.

The checking device for the screw-blanks is arranged in a box, E, Figs. 5, 6 and 7, secured to the center of the cap-plate and clearly seen also in both perspective views. A vertical opening is formed in the rear wall of the box and coinciding with the mouth of the track T, the width of the opening being slightly in excess of the size of the shank of the screw-blank. The upper portion of the opening is made flaring, as at r , Fig. 7, to freely receive the heads of the blanks. A vertical slot is formed longitudinally of the checking box, intersecting the opening just described as coinciding with the mouth of the track T. A plate, p , is fitted to move back and forth in this slot, and has on its lower side a pin, p^3 , which engages the slot f^2 in the cam-plate F, the latter, in part, fitting into the base of the checking box. By means of this construction it will be seen that by moving the cam-plate back and forth across the machine the slot f^2 will cause the plate p to reciprocate longitudinally on the machine. It will now be clearly seen that when the plate is in its extreme left-hand position, as in Fig. 7, the column of blanks in the runway T is held in check, but by moving the plate in the opposite direction the opening in the check box opposite the track T will be uncovered, and the pressure of the column of blanks will force them ahead, one of them sliding into the path of the plate p ; this will be more readily understood from Figs. 5 and 6. The point of the blank rests upon and is supported by a ledge. A spring-pin, n^1 , mounted on the box E just in advance of the blank, serves to maintain the latter in position until the plate p , upon its return stroke, engages it, and forces it past the yielding pin and from the support. The blank then drops into the vertical circular opening in front, down through a central hole formed in the plate C, and into the holding jaws e , which at the instant are separated slightly for the purpose. A cover is provided to close the top of the box E. This also serves to prevent the blanks from rising, an extension of it at the same time maintaining the blanks in position upon the runway T (see Fig. 6). A pin, mounted at the rear of the checking-plate, and shown in the end view on the first plate page, serves, when pushed forward, to temporarily keep the column of blanks from passing into the machine. It will be seen, referring to Figs. 4 and 5, that two thin strips, h^1 , of metal, beveled at their upper edges, as at h^2 , are arranged to receive the blank between them immediately upon its being forcibly ejected from the box E. These metallic strips are secured to the cross-heads, contiguous to the front ends of the threading dies, and serve to support the blank until the ribs of the dies have fairly commenced to act upon it. At the same time the blank is maintained in a vertical position by the jaws e which inclose it.

In following the threading process to which the blank is subjected we will assume the main gear in Fig. 1, operating the connecting-rod c to move in the direction of the arrow. The front cross-head B, with its die, will then move ahead, and through the side racks and the pinion on the shaft d will force the opposite cross-head to move in the reverse direction. The relation of the cap C and cam-plates to each other is as represented in Fig. 10. This movement of the cross-heads will cause the cam-plate F to slide backward through the medium of the rod s^2 and the pin u , which works in the cam-slot f^1 , thereby, in conjunction with the two cam-slots f^1 and pins e^1 , separating the jaws e . At the same time the cam f^2 , acting upon the checking plate p will be forced back to uncover the opening in the check box E opposite the track T, the form and

travel of these several cams being so arranged and timed that the holding-jaws begin to open immediately after the ribs of the thread-forming dies D have seized upon the blank. The continued travel of the dies impresses a screw-thread into the blank. As the dies pass each other at the extremes of their travel the threaded blanks will drop from them into a space beneath. Upon the return stroke, and immediately preceding its termination, the next blank to be acted upon will be forced past the check-pin n^1 into the jaws e by the action of the cam f^2 and the checking plate p . At the commencement of the next forward stroke the blank will be retained by the closed jaws, and also supported by the strip h^1 , as clearly shown in Fig. 7. The dies now, in again traveling ahead, seize the new blank between them, and roll or impress a screw-thread upon it, as just described. It is, of course, understood that during the reciprocation of the cross-head the blanks are automatically fed from the hopper and along the track T to the checking device by the vertically traveling "pick-up" blade.

We come now to the threading dies and to the principle involved in forming the threads, which is both novel and ingenious. The upper part of Fig. 14 represents a plan of one die face, and the lower part a section along one of the grooves, as $x x$. We will explain here that the dark portions marked $b b$ represent grooves, and the parts $a a a$ indicate ribs. The dies, which are of hardened steel, are milled in special machines of ingenious design, which we cannot stop here to consider. The grooves are V-shaped, the sides having the same inclination to each other as the opposite sides of the screw thread to be produced. This inclination, we need perhaps scarcely add, is constant from one end of the die to the other, and the work of raising the thread is mainly performed by these sides. The height of each rib and the width of its face or top, however, vary throughout the length of the die, and are determined at every point by the depth of the adjacent grooves. The face of each rib is substantially level, and has the form of a truncated wedge, very narrow at the end h , where the rolling commences, and much wider at the opposite end. The rib, in fact, is made as narrow at the entering end as is consistent with strength, in order that but little metal need be displaced when it enters the screw blank. To facilitate its entrance the top may be slightly chamfered, as at f . The action of the dies, always considering that there are two of them moving in opposite directions, will probably be readily understood when it is noted that at the beginning of the stroke the narrow ribs h are at once forced into the screw-blank to as great a depth as it is desired the ribs shall go at any time during the stroke. We may consider, then, that wide but comparatively thin strips of the metal of the blank are taken into the correspondingly wide grooves of the die at that end, and as the rolling progresses and the grooves in the die blocks become narrower the metal in them and between the ribs becomes more and more compressed, and gradually expands into the grooves of the dies, until at the end of the operation it fills them and the thread is completed. The blank is not stretched in the slightest, the length of the finished screw and of the blank before entering the dies being identical. This is due to the fact that there is no pressure on the body of the blank, radially, but all the work is expended on the metal between the ribs of the dies.

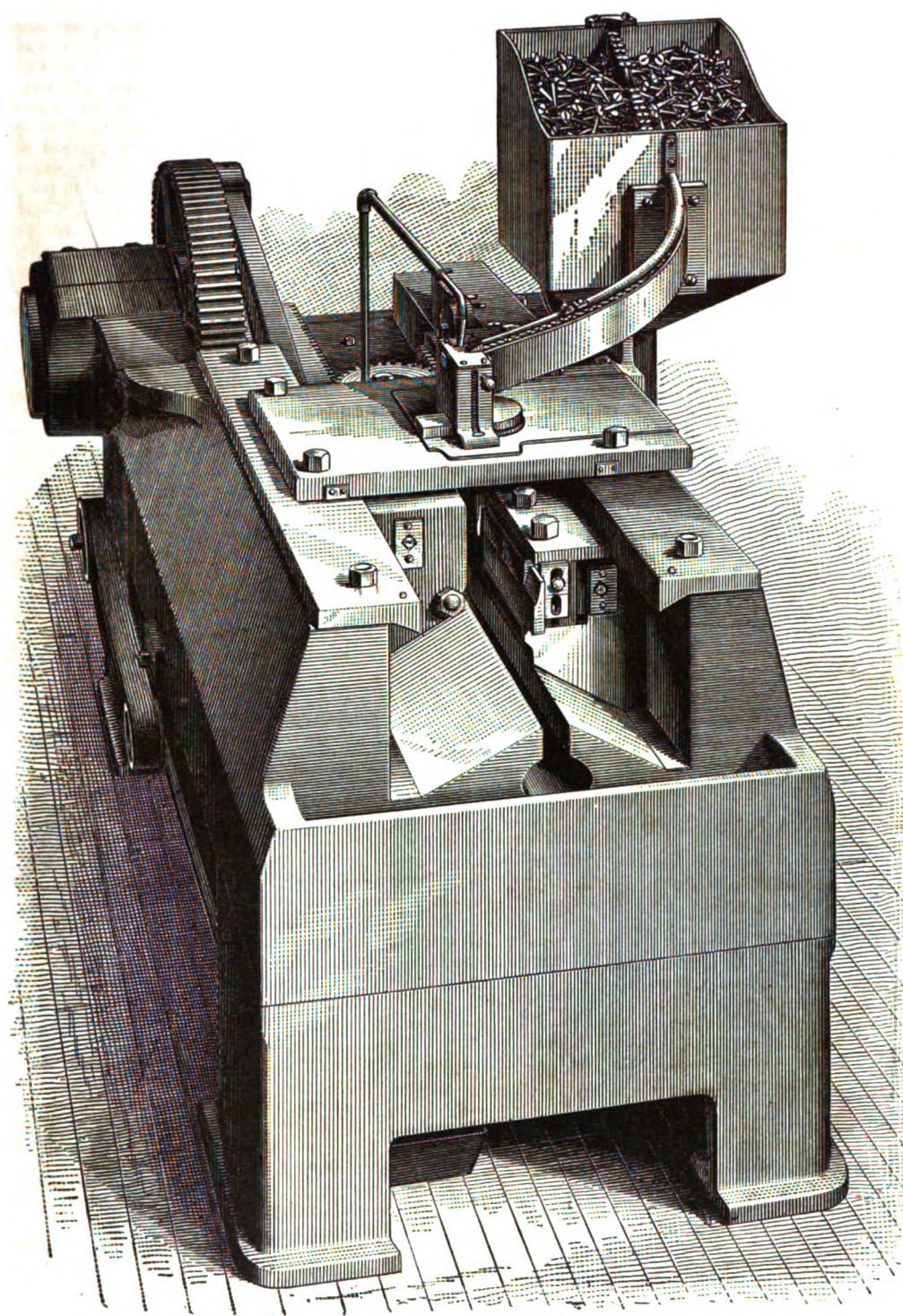
Perhaps more light will be thrown on the operation by an examination of Figs. 15, 16, 17 and 18. The text beneath these gives all the explanation required. The threads of the screws rolled in this

way are very thin as compared with those of the ordinary cut wood screws. The advantage of this construction is that they enter the wood easily, and without displacing as much of it as does the cut thread, and with much less driving force. They have also long and tapering points, which at once commend themselves. The most important difference, however, in the new screw is the reduced diameter of the shank between the head and the commencement of the thread, doing away with the necessity of using two bits in hard wood to avoid splitting. The diameter of the shank of the screw is only slightly greater than the diameter of the core of the threaded portion, so that by using a single bit of the exact diameter of the unthreaded portion the body of the screw will exactly fill the hole made by the bit and the threaded portion will lie entirely in solid wood, into which the thread has entered, thus securing, it is claimed, a much firmer hold than is usually obtained, while the danger of splitting the wood is reduced to a minimum. To the more than ordinarily large heads of the screws for given sizes of wire we have already referred. Owing to the small shank for the size of screw produced, further, it is noteworthy that a No. 18 screw, for example, may be turned out from No. 12 stock, an advantage well worth considering. One other feature to be noted in the rolled screw is the very gradual reduction in the diameter of the body where the thread begins, and the breakages at this point noted in ordinary screws, due to the shoulders formed, are entirely avoided. The rolling process finally saves about 40 per cent. of waste metal which the operation of cutting screws entails. We understand that some of the screws have been put in the hands of large consumers who are competent judges, like the Brown & Sharpe Mfg. Company, Pullman's Palace Car Company, the C. B. & Q. Railroad shops, and many others, and, after careful tests, have been given very flattering testimonials. The American Screw Company inform us that they will probably exhibit some of their machines at Brussels. Companies may also be established in England and Germany.

We would add that the new processes involve such a complete revolution in screw manufacture, and the investigations are upon such entirely new ground, that the American Screw Company have found it desirable to secure home and foreign patents on the various mechanical devices, processes of manufacture and products exemplified. The company have experimented very carefully during the past few years and are now building machinery on a large scale as rapidly as possible for use in manufacturing.

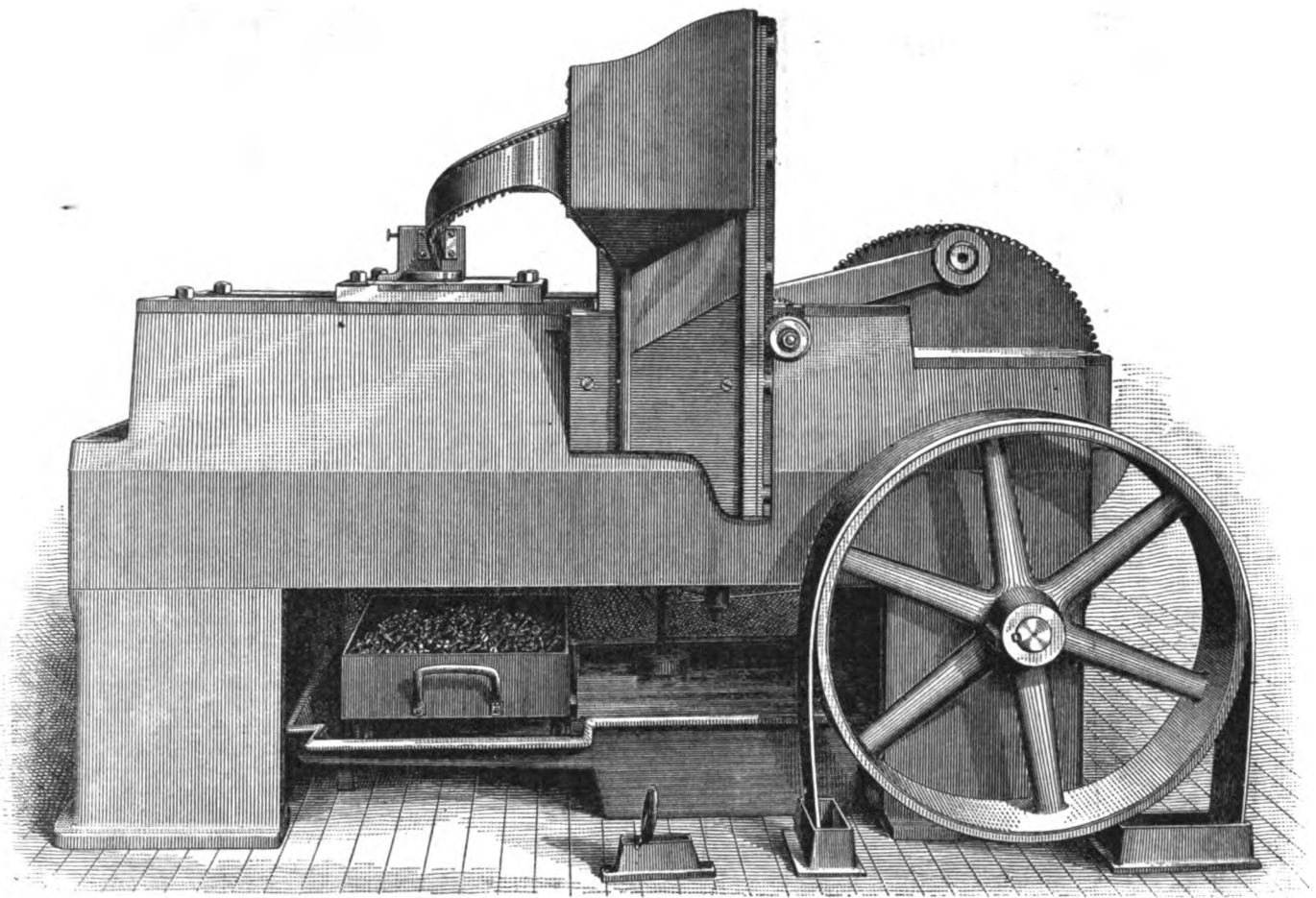
The New York City budget for 1889, as just made up by the Board of Estimate and Appropriations, looks well for the tax payers. As finally passed it footed up \$37,637,069.91. Of this \$4,602,760.74 will come out of the general fund, leaving \$33,034,309.17 to be raised by general taxes. Comptroller Meyers stated that, while the budget is about \$600,000 more than last year the tax levy will be about \$800,000 less and the tax rate will probably be reduced from 2.22 to 2.16 or thereabouts. This reduction will be due partly to increased valuations, but more to the fact that large accounts which have been standing on the Comptroller's books for years have been turned into the general fund. The tax rate next year will be the lowest for many years. The city debt is now \$132,457,395.46.

The Boston Steam Fitters' Association was organized last week, to promote the interests of their trade. The association resolved to attend a course of lectures on Steam engineering by Prof. Peabody.



End Elevation.

SCREW ROLLING MACHINE. AMERICAN SCREW COMPANY, PROVIDENCE, R. I.



Side Elevation.

SCREW ROLLING MACHINE. AMERICAN SCREW COMPANY, PROVIDENCE, R. I.

Coal and Iron Mines in the Tennessee Valley.

Allusion has been made in an article published in *The Iron Age* of December 13, page 890, to the large area of coal-bearing lands on the east of the line of the Cincinnati, New Orleans and Texas Pacific Railway. It is the great coal field of Tennessee, containing several mountains which rise over 3200 feet above sea level and many which are over 2500. These great heights take in a series of coal strata unknown to any area immediately on the line of railway. This great area, which has been denominated the "Upper Measure Coal Field of Tennessee," can be reached by branch roads up New River, up Black Wolf Creek, and by direct lines from Lansing or Oakdale. With the advantages of the road-bed of the Cincinnati Southern division for transporting freight at low rates, and the ease with which that area of coal can be reached, it should attract the attention of capitalists. A road with far better grades and curvature than that up the mountain at Tracy City can be built at comparatively low cost from Oakdale into the Crooked Fork coal field, where it would reach large area of coal, as well as a great amount of virgin timber. The road would have the great advantage of being all down grade with the loaded car. At Emory Gap, the Walden's Ridge Railroad forms a junction with the Cincinnati, New Orleans and Texas Pacific Railway. This road runs thence to Clinton on the Knoxville and Ohio Railroad, passing by the Poplar Creek Mines. These mines are 16 miles from the Cincinnati, New Orleans and Texas Pacific Railway, and a large part of their product should pass over it; and of such importance are they in the extent of the field and the superior character of the coal that they deserve notice, though they may not be considered as directly in the territory of the Cincinnati Southern. The larger part of the land in the Poplar Creek field is owned by the Coal Creek Mining and Mfg. Company, which company do not operate itself, but lease to others. A comparatively small area belongs to other parties. The locality has the capacity for being one of the important coal-producing areas in the South, there being so many points from which good entries can be made into the coal seams, as well as the number of easy outlets from the mountain. The companies now operating there are small, the complaint being most of transportation. From the Poplar Creek mines to the Cincinnati Southern is 18 miles, from that junction to Chattanooga is 79 miles, a total of 97 miles. But the coal does not travel that route now. It goes to Clinton, 16 miles, thence to Knoxville, 20 miles, thence to Chattanooga, 111 miles, total 146 miles. On the other hand, all coal from the Knoxville and Ohio Railroad for Kentucky points is brought to Clinton, thence over the Walden's Ridge Road to the junction at Emory Gap, and thence north by the Cincinnati, New Orleans and Texas Pacific.

The mining operations on Poplar Creek are as follows: Joe Richards & Sons, 60 hands, product about 150 tons per day. Winter's Gap Coal Company, 75 hands, product 125 tons per day. Eureka Coal Company, 33 hands, product 75 tons per day. Mitchell & Bro., 33 hands, product about 60 tons per day. Mt. Cartoon Coal Company (Wiley & Bro.), two openings, 39 hands, including those getting props and cross-ties, product 150 tons per day. The Cumberland Coal and Coke Company is a new one, which proposes large operations, but at present is only working in a small way, the number of hands being now 26, and the product 100

tons per day. The capital of this company is from Atlanta. The total present product is 660 tons, from an area which should ship at least 2500 tons of coal and coke per day. There is ample room for another railroad into this field.

The first mines on the line of railway after it reaches the Tennessee Valley are worked for iron ore of the red fossil variety. The foot of No. 1 mine is about 1 mile from the railroad station. It is operated by Col. Thos. Brown. The product averages 95 tons per day, and 35 miners and 8 outside men are worked. The distance to the railway is 610 yards, and loaded cars drop down by gravity. The mine is worked by a slope 400 feet long, the vertical height being 235 feet. The vein ranges from 2½ to 5 feet in thickness, averaging above 4 feet. The ore at the depth of 235 feet below water level is found to be about as good as that near the surface.

No. 3 mine is 2 miles from the station, and is also operated by Col. Thomas Brown. There are 23 miners and seven outside men employed there, and the average product is 75 tons. The vein averages 3 feet 3 inches in thickness. It is 700 yards from the railway, and the cars drop down by gravity as at No. 1. Nearly all the ore from both these mines goes to the Dayton furnaces. Between Nos. 1 and 3 another mine is being opened by Brown & Tarwater. It connects to the main line by a wide-gauge track. At Rockwood Brown & Tarwater operate two mines, the product of which all goes to the Rockwood furnaces.

The Rockwood furnace was the pioneer in the manufacture of iron with coke in the South and the forerunner of the great industrial development now flourishing in the Southern States. The mines were opened and the first furnace erected in 1867 by Gen. J. T. Wilder and H. S. Chamberlan. The coal mined is entirely used in the two furnaces, at which and in the mines is worked a total of about 250 hands. The product amounts to about 60,000 tons per annum. This coal is in Walden's Ridge, an outer wall-like part of the Cumberland Mountain, where the coal and all other strata dip at an angle of about 45°. A part of the coal mined is made into coke, and some is used raw as in the furnace. Only one stack is now running, and the product is about 40 tons per day. The property belongs to the Roane Iron Company, Mr. M. Duncan being the superintendent. There is no doubt but that these furnaces have been the most regularly profitable of any in the Southern States.

The Dayton Coal and Iron Company are one of the largest operators in the South, and is almost, if not entirely, owned in England. W. J. Isaacson, of Cincinnati, is managing director and Geo. Jamme general manager. No expense has been spared in the plant and equipment, and there is every indication that under present management the enterprise will be a success. The town of Dayton, where this operation is located, is 297 miles from Cincinnati, and 83 from Chattanooga. Eight years ago it was an old field; now it is a place of fully 4000 inhabitants, the development being caused by the erection of the iron furnaces, the working of the coal and iron mines and the building of the Cincinnati Southern Railway. The plant consists of two stacks, one 75 feet high with 20 feet bosh, the other 75 feet high with 18 feet bosh. No. 2 has averaged in October 92 tons per day, and No. 1 averaged for the same time 85 tons per day. They are each equipped with three Whitwell fire-brick stoves and three Weimer blast engines. The first furnace was put in blast in 1886 and the second in 1887.

The coke ovens are 1½ miles from the furnaces, and the coal mines in the mountain over them. The original coke ovens

erected here were built on a patented design in which the waste gas was used to heat the oven. Mr. Jamme took them out and used nothing but the plain bee-hive oven. Of these there are 250. There are two mines, one the Richland, the other the Nelson. The latter is by far their best and most reliable seam of coal, and must eventually be their dependence. It very regularly averages 4 feet thick, while the Richland is very variable, frequently running down to a small thickness. The output of these mines averages each about 1850 tons per week, almost all of which is made into coke.

The coke made here was for some time poor and very friable, but Mr. Jamme has introduced a machine called a disintegrator, through which he passes the coal before coking, greatly to its improvement. Coke made from coal not run through this machine is liable to be full of large pieces of slate frequently as large as one's hand, and, in handling, the coke was certain to break apart at those places where these pieces of slate were whether they were large or small. It is not claimed that the machine takes out the slate at all, but that it so finely disintegrates it that it is no longer perceptible to the eye, and that it is so disseminated through the coke that it does not affect its cohesiveness. The difference between the two cokes, disintegrated and non-disintegrated, is very apparent at a glance, and is clearly apparent in the working of the furnaces. On October 13, No. 1 stack running on coke from disintegrated coal made 101 tons of pig iron, while, on the common coke, under the same conditions of blast and weather, it only made 85 tons; No. 2 stack, running on coke from disintegrated coal, made 103 tons per day, while on ordinary coke she only made from 93 to 95.

The main entry in the Nelson mine is 2400 feet long, and is being continued onward. This company went about their work systematically, and, having an area of 80,000 acres, wanted to know what was under the surface. To this end they have had nine holes bored, and know the locality of the Nelson seam for several miles ahead. At 4200 feet distance it was found to be 6 feet 7 inches thick. Mining in the Nelson mine costs but little over half what it does in Richland; hence, when that mine has been sufficiently opened to fully supply their needs the cost of their coke can be very materially reduced. The number of miners employed is 400; and at the furnaces, 100; other hands, 200; a total of 700 employees. Thus we may safely assume that directly 4200 beings are dependent upon this enterprise which has grown out of a wilderness in less than 7 years. It is of value to the railroad in that its 1300 tons of iron per week must be carried away and fully 200 tons of ore brought in each week.

The company own a line of railroad to the Tennessee River, by which they bring in ore from the up-river mines, and on which is located one of their limestone quarries. They also have tracks to the coal mines and coke ovens and to another limestone quarry, all of the run being of standard gauge. The iron ore used is nearly all bought from outside parties. They use soft red fossil ore from Eureka mines (Welcker's) on the Tennessee River near Kingston; ordinary red fossil from Brown's, near Emory Gap; some soft ore from Attala, Ala., and a brown hematite from Georgia. They do not now use any of what is known as the hard red fossil ore. The average consumption is 2½ tons of ore to the ton of iron made, with 1.9 tons of coke, and 1 ton or less of limestone. North of Dayton, near Darwin, on land belonging to W. T. Darwin and Mr. Guess, leased by S. L. Wilkie, a seam of coal is being worked and a number of carloads shipped. He works about 80 hands. South of Dayton, at Graysville, a consider-

able operation has been commenced. It is carried by Winchester & Ivins, who lease from Chas. J. Fox. Shipments have just commenced and about 30 hands are employed. A narrow-gauge track connects from mine to main line of railway.

The Walden's Ridge Coal and Coke Company, located near Sale Creek Station, is the next mining operation on the line of the railway. Of this company M. H. Clift is president; J. M. Clift, secretary, and A. Lloyd, superintendent. The product is 200 tons per day, and 150 miners and other hands are employed. They have 45 coke ovens and make 100 tons of coke per day from slack coal. The mine is one mile from the main line and connected to it with a wide-gauge track. The seam worked is not in the main mountains and has an average thickness of 4 feet. The Soddy Coal and Coke Company is the oldest mining operation on the line of the road. The coal having been worked there before the war, and afterward long before the railway was built, the coal having been hauled to the river on a modern tram and boated to Chattanooga. M. H. Clift is president, Robt. Morrison, vice-president, and J. T. Hill, secretary and treasurer of the company; A. Lloyd is superintendent at the mines. The product of coal is about 8000 tons per month, the number of employees being 375 miners and outside hands. They have 165 coke ovens, and make, when running full time, 2000 tons of coke per month. The company erected apparatus for washing the slack, but not finding that they received any increased price for the coke from washed slack abandoned the plant. The distance from the main line to the mine is three-fourths of a mile. The company's property comprises 8200 acres of land. The station on the railroad is called Rathburn, which is 21 miles from Chattanooga, but the name of the post office is Soddy.

The Daisy Coal and Coke Company is the next operation, being three miles nearer Chattanooga, and is the last one on the line of the railway. This mine was opened six years ago and failed. It was, after lying idle for some time, taken hold of by Tabler & Crudup; later they sold out, and it is now operated by Aydelotte, Williams & Price. The product amounts to an average of 200 tons per day, all of which goes to the Central Railroad, of Georgia; and 100 hands are employed. They have 50 coke ovens, but are now running only 25, the product going to New Orleans for foundries, and to the Citico Furnace, near Chattanooga. The seam worked is about 4 feet thick, and is one mile distant from the main line of railway, with which it is connected by a narrow-gauge track.

The Philadelphia Natural Gas Company, at Pittsburgh, has sent a confidential circular to all the leading manufacturers of that city who use gas supplied by that company requesting them to prevent waste of that fuel at their respective works. The request, the circular suggests, can best be carried out by the managers of the various plants instructing watchmen, furnacemen and other employees to shut off the gas from all furnaces or other parts of the mill when the latter are not running. A large amount of the fuel is wasted, it is claimed, by allowing it to burn at night and over Sunday when the factories are closed down.

The coke operators of the Connellsville region held several meetings in Pittsburgh last week and finally concluded to make no advance in the price of coke for the present month. There was great diversity of opinion among the operators as to whether there should be an advance, four of the largest producers favoring it, while several others opposed it.

New Drawing Press.

A new drawing press, suitable for making drawn tinware, kitchen boiler and soda-water tank-heads and similar work, is being brought out by the E. W. Bliss Company, of Brooklyn, N. Y. The engravings which we annex explain the nature of the design.

The press embodies one feature especially novel in a tool of this size, though

the toggles were secured by a sort of straight-faced cam carried by the continuously reciprocating cross-head, and the blankholder was lifted directly by the latter.

In the improved press which we illustrate no cams are used, as will be made clear by reference to the sectional view. The cross-head A, which carries the drawing punch, is actuated by side-rods from the main cranks B, of which there are

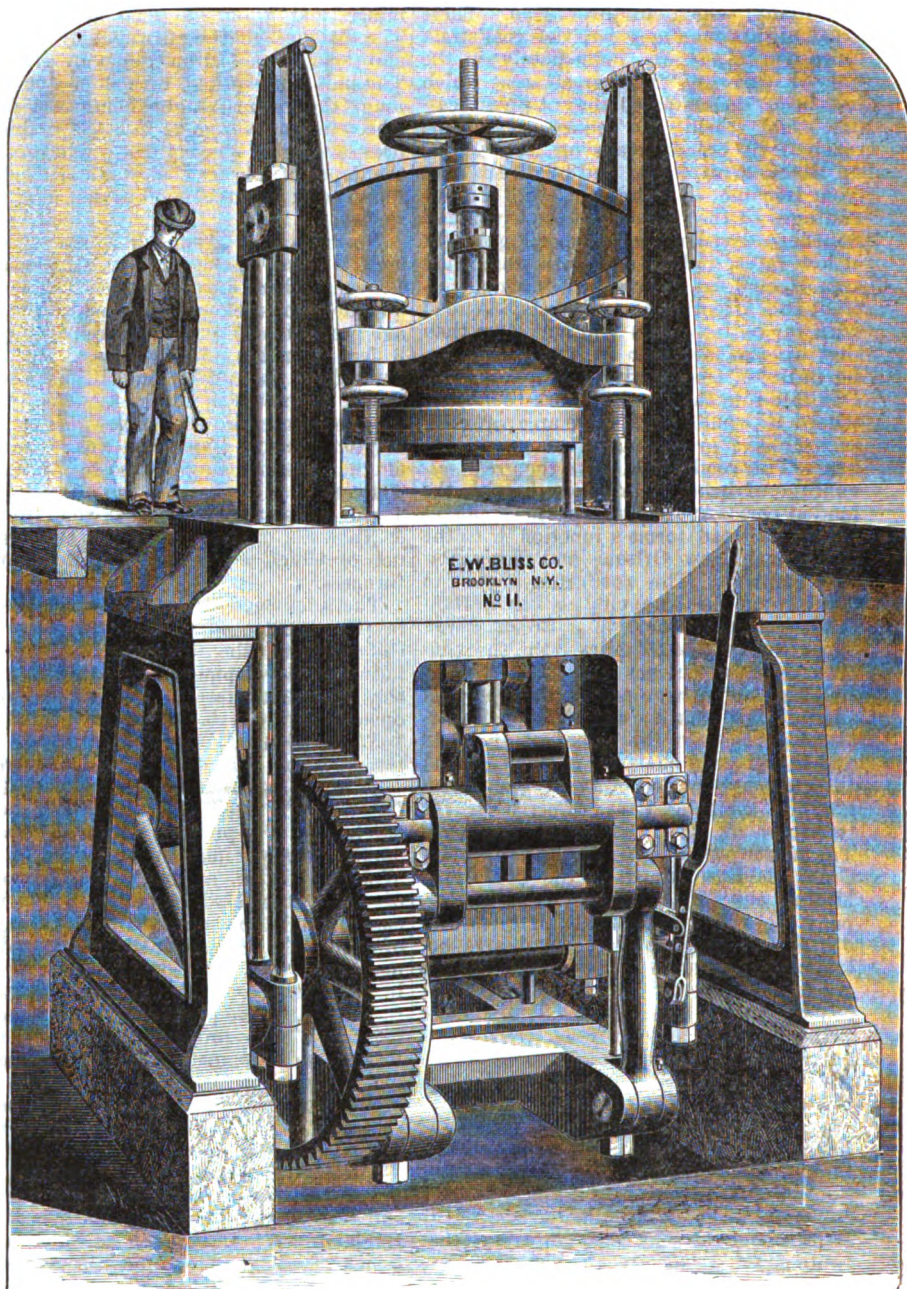


Fig. 1.—General View.

NEW DRAWING PRESS, BUILT BY THE E. W. BLISS COMPANY, BROOKLYN, N. Y.

it has been in use for a few months past in smaller machines built by the same company. This is the introduction of a peculiar system of toggle link-work for operating the blankholder or pressure-plate, which admits of the intermittent motion required to be obtained from the continuous rotary motion of the main crank-pin. The idea in itself of using toggles for the purpose mentioned is not new, the novelty lying in the special arrangement for operating them. About seven years ago the Bliss Company built a large drawing press for export to Switzerland, in which the blankholder was held down by toggles, but in this machine

two, one at each end of the main shaft. The crank-pin on the left-hand side of the machine is made long enough for a connecting-rod, C, which imparts a vibratory motion to the rock-shaft D at the rear of the machine. This shaft imparts a similar motion to the cross-head E, from each side of which extend short links to the toggles. It will be seen that while the crank-pin is moving from the position shown to the point F the rock-shaft, and consequently the cross-head E, will receive very little motion, and, as the links which connect this cross-head with the toggles lie in a position at right angles with the line of its motion, the toggle levers will receive a

very small lateral motion, which will have no effect upon the yoke G, to which they are linked; so that while the main crank passes through the part of its stroke mentioned the yoke G, and consequently the blankholder H, to which it is connected by four tie-rods, will remain at rest. As the crank passes its center, after having done its work, the cross-head E is thrown downward, and at its extreme position carries the toggles into a horizontal position, T K, thus lifting the yoke G and the blankholder. The press takes a blank 36

only about $\frac{1}{8}$ of the energy of the fuel is used in the propulsion of the vessel; so that, notwithstanding the progress which has been made, there is still a wide field for the ingenuity of the engineer and the shipbuilder.

The Cost of Electric Street Lighting.

The following figures of the charges for lighting streets with arc lamps are of interest. They have been quoted from a communication of the Boston Citizens' Asso-

cost \$131,097.97. All of this, except \$11,299.54, was received by one company. It seems very clear that Boston needs a little healthful competition. It is interesting to notice how important a factor carbons are in the cost of electric arc lamps. It seems like hoping for an impossibility to think of indestructible electrodes being possible, yet until some advance in that direction shall have been made the electric light will be far from perfect.

Seventeen-Inch Imperial Engine Lathe.

This lathe was designed by Messrs. Lodge, Davis & Co., of Cincinnati, Ohio, to meet the demand for a tool without extra attachments, and is essentially a manufacturers' lathe. The name of "Imperial" was given to distinguish it from their original line of lathes that have a full set of extra attachments. While the Imperial lathe will be without compound rest, taper attachment or automatic stop, the quality of the material and the workmanship will be fully up to the high standard of their original lathes.

After a most careful study of the true requirements necessary to produce a first-class tool, the builders decided that a solid bearing, bored taper, with the spindle turned from crucible steel, as hard as it can possibly be worked, makes the best possible construction. There is much less liability of its losing alignment, there can be no tinkering with half boxes, no looseness of spindle in bearings, but as near to absolute solidity as is attainable. The head is designed with a special view of securing great strength for end thrust. Being hollowed out sufficiently to make room for a cone pulley and belt, the front and back are carried as high up as possible, and webbed clear across from end to end, making two beams, well tied together, and capable of resisting the most severe end strains. Any wear on the spindle or bearings is taken up by drawing the spindle toward the back end. The part to which the adjustable screw is fitted is cast with and forms part of the head. Using solid bearings has been objected to on account of taking apart and putting together of the head. This difficulty has been overcome by a means of taking out the key that fastens the face wheel, through the hub. No difficulty whatever, we are told, is experienced in taking the lathe apart. This little matter, simple as it seems, has probably deterred many makers from adopting this construction. The screw cutting arrangement (which cuts from 4 to 20 threads to the inch) is driven from the spindle on the outer end. The reverse plate is made particularly strong, the studs being part of the plate itself, and therefore cannot become loose. Great care has been taken in this particular in order to make it meet the demands made on it when cutting heavy screws.

The gearing is arranged so as to be close to the bearings. The lead screw, which is directly under the front of the lathe, is engaged by two half nuts fitted directly to the carriage, not fastened to the apron, and the whole design is so arranged that no part depends on the strength of either bolts or screws when chasing. The opening and closing of the half nuts is performed by a cam of new design which is very simple, durable and effective, locking itself both ways and operated from the front. The feeding devices are of the most substantial character, and no worm or worm gears are used. The tool block is of substantial design, and has a bearing on the cross side of the carriage of 18 inches. The tool post has a bearing in a square shoe, bored out so as to give full bearing to resist the heavy strain of the cut and the continual tightening and loosening of the tool. The

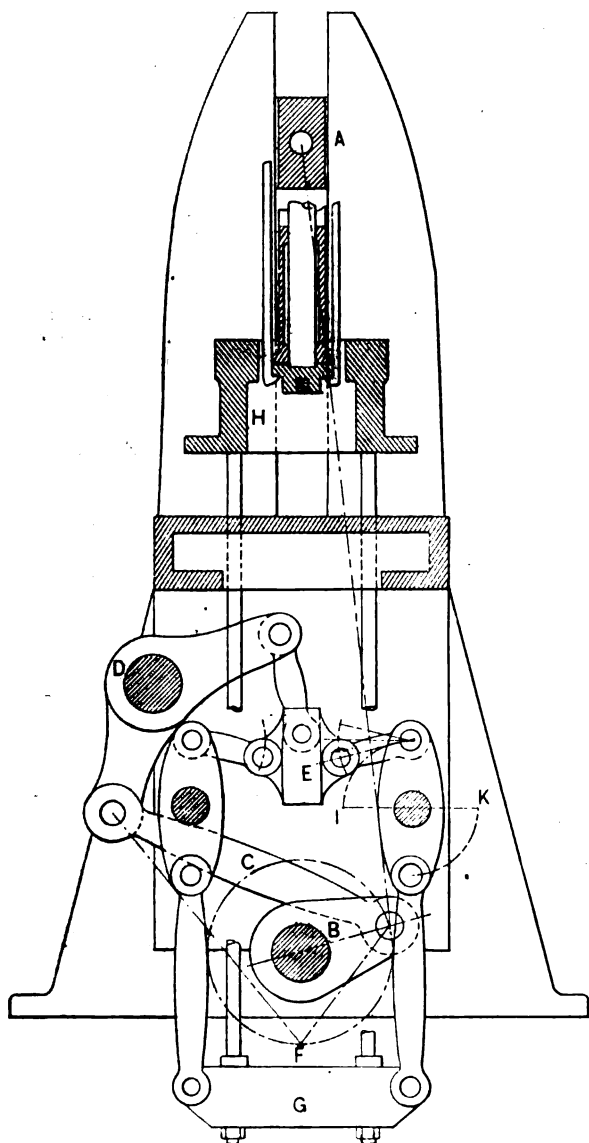


Fig. 2.—Details of Toggle Arrangement.

NEW DRAWING PRESS, BUILT BY THE E. W. BLISS COMPANY,
BROOKLYN, N. Y.

inches diameter, and will work stock up to about No. 8 gauge. The stroke of the punch is 20 inches, and that of the blankholder is 14 inches. The main shaft is 10 inches diameter, and is made of forged steel. In all parts the press is built exceedingly heavy, with large bearings, enabling it to do extra work. The total weight is about 50,000 pounds.

The complete efficiency of a marine engine is the resultant of the separate efficiencies of the boiler, the steam, the mechanism and the propeller. To give a rough idea of the value of this, the first of these components may be assumed at 0.6, the second at 0.2, and the third and fourth combined at 0.5, so that the resultant efficiency is 0.06—that is to say, that

ciation, which was addressed to the Board of Aldermen of that city for the purpose of showing that Boston is overcharged for this service. For New York, the average price is given as 34½ cents per lamp for one night's service. Brooklyn pays 55 cents, Buffalo 45 cents, New Orleans 34 cents, Philadelphia 50 cents (average), and Baltimore 50 cents. Boston pays 65 cents. The Citizens' Association of Boston claim that on the 695 lights used in their city the reduction in cost of carbons from the figures of 1882 represents 25 cents per lamp for each night, an aggregate of about \$60,000 per annum. The price of carbons in the last six years has fallen to less than one-third the original price. Yet Boston is now paying the same rate paid in 1882—65 cents per lamp. In 1887 the service

front bearing tapers 1 inch in its length, and is $2\frac{1}{4}$ inches in diameter. The lathe is furnished complete with all screw cutting gears, large and small face plates, steady and follow rests, and full counter-shaft, which has 12-inch tight and loose pulleys, and which should run 130 revolutions per minute. The lathe is made with 6, 8, 10 and 12 foot bed, and of 17-inch, 21-inch, 24-inch, and 30-inch swing.

A New Safety Lamp.

The important question of the application of electricity to miners' safety lamps was under discussion at the meeting of the Manchester Geological Society. Mr. Oswald Swete described a new safety lamp brought out by the Mining and General Electric Lamp Company of London. He stated that in 1885 a great advance in secondary batteries was made by Mr. D. G. Fitzgerald, who did away with the dead weight of support, and obtained a dense, hard, and highly conductive plate of solid peroxide of lead for his negative element, which he termed lithanode. It contains no support whatever, but consists wholly of active material, and a two-cell miner's lamp constructed with this kind of element will weigh from four to five pounds. The small weight of lithanode batteries brings them to the front for mining purposes, and besides this advantage there are others—no renewal of elements is required, no gases are evolved on discharging the current through the lamp, and there is therefore no necessity for valves or other complicated arrangements, while the present weight of the lamp, which is 5 pounds, can be considerably reduced. The electro-motive force is four volts, and it burns for twelve hours with one charge from a dynamo machine of five hours. The battery case is made of birch, occupying as small a space as possible, and rendered water and acid proof by a patented process. The glass protector covering the lamp is so arranged that in case of breakage the current is cut off before the blow that broke the cover can reach the incandescent lamp, and an explosion from contact with fire-damp is thus rendered impossible. The cover can be locked with a lead plug, as in ordinary safety lamps, and the action of putting on the cover lights the lamp, which the miner cannot put out except by breaking the sealed plug. By undoing four nuts inside the battery the whole of the elements can be instantly withdrawn when required for repair. So far the plates have been tested to two and a half years, and they are practically indestructible. The lamp can be turned upside down without detriment, and if turned at an angle does not go out. As to cost, he estimates 1000 lamps, with a 5-unit dynamo machine, instruments and wires, at £1090, and the lamps could be maintained at $2\frac{1}{2}$ d per lamp per week, burning 12 hours per day six days to the week. Mr. J. S. Burrows next gave the result of trials he had made of the Edison-Swan safety lamp, and, while fully recognizing the much superior light that was obtained from this lamp as compared with that given by the ordinary safety lamp, he said there were several important features requiring improvement. First and foremost is the heavy cost of the lamp, and in its construction there are one or two defects which ought to be removed, while it should also be more easy to repair than is the case at present. If this were done the lamp would soon take its proper place in the market for underground use.

A. H. Danforth has resigned from the position of general manager of the Colorado Coal and Iron Company, of South Pueblo, Col., and S. H. Dupuy, of New York, has been appointed to fill the vacancy.

The New Style Korting Double Tube Injector.

The new style Korting double tube injector which Messrs. L. Schutte & Co., Philadelphia, Pa., are now putting on the market, is, in several respects, a decided improvement on the older form and will at once commend itself to users of apparatus of this class. The engravings which we publish in this issue illustrate both types, and afford a ready means of comparing the two and understanding more clearly wherein they differ from each other. The older form we have

for Stationary and Marine Boilers and Locomotives. The exact nature of the improvement becomes apparent from Figs. 3 and 4, the latter, like Fig. 2, representing a longitudinal section. It will be noticed at once that the operating lever has been placed at the front and the steam connection has been changed from the side to the top. All the working parts, moreover, are on the outside and are more direct in action. The tubes themselves slightly converge. A specially interesting feature of the improvements is found in the mechanism for opening the steam valves. In the position shown in Fig. 4 these valves are

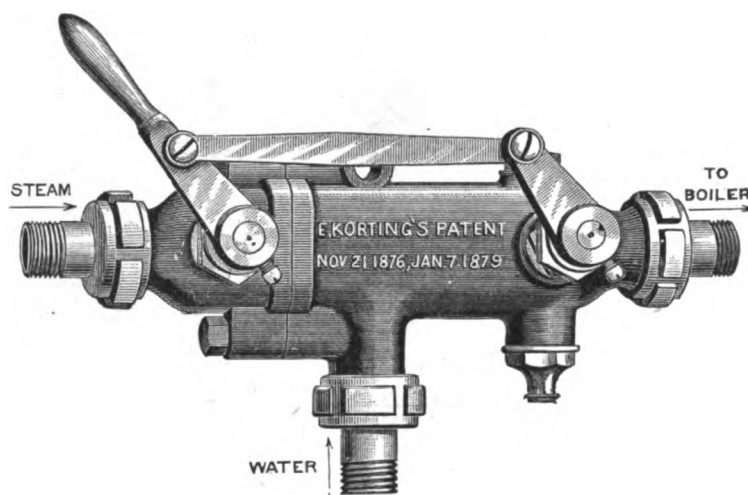


Fig. 1.—General View.

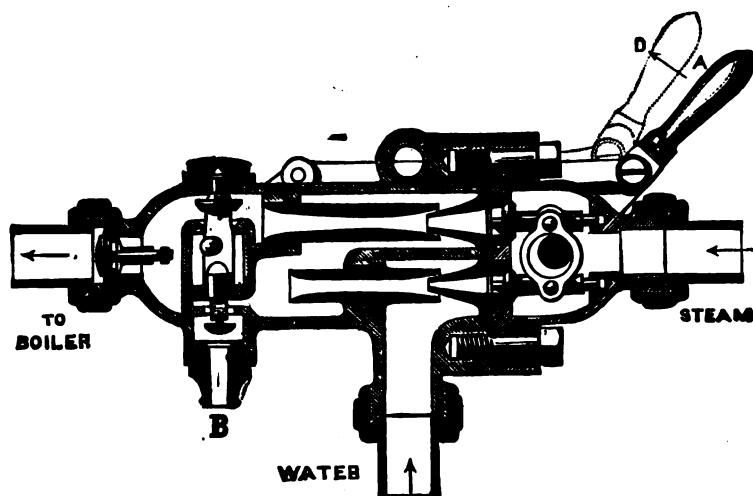


Fig. 2.—Longitudinal Section.

THE OLD STYLE KORTING DOUBLE-TUBE INJECTOR.

thus reproduced at the risk of being charged with repetition.

The double-tube feature itself, used in both designs, offered important advantages over the single-tube construction of the general class of injectors, and insured good work where other boiler feeders failed to operate, besides making adjustment with varying steam pressure unnecessary. The earlier injector, however, as shown in Figs. 1 and 2, was arranged with a side lever for operating, and accordingly was turned out in right and left hand patterns, and the steam and over-flow valves were worked by inside eccentrics. In the new form the whole arrangement has been much simplified, and the injector is now practically universal, there being but one standard form, with no occasion for right and left hand connections, and it is applicable both

closed, but by simply drawing the handle A over toward the position indicated by the dotted lines D, the valve of the lower or lifting nozzle, guided in one of the plugs or caps K, is opened through the intervention of a cross bar. Owing to the presence of a small amount of lost motion in the cross-piece connections, this valve can be opened appreciably while the upper valve still remains closed under the pressure of the entering steam. The latter, flowing through the lower nozzle, lifts the water through the tube; as soon as the water appears at the overflow B, the handle A is drawn over still further, closing the overflow valve through the bell crank on the outside (see Fig. 3) and opening wide the lower as well as the upper steam valve. The injector is then feeding into the boiler, the lower tube lifting and the upper one

forcing, the water. We need not specially comment on the new arrangement of working the steam and overflow valves as compared with the older inside eccentric movement. Its simplicity will no doubt be generally appreciated. The whole work of operating the injector in the new as well as in the old form is accomplished by means of only one handle, and there are no separate valves to give rise to confusion. The dirt stop, shown at the right, can be readily removed from the feed pipe in case cleaning should become necessary. The

but competition is so keen that there have been but two profitable years in the trade since the panic of 1873.

He says the duty on pipe has afforded no protection to this industry, except in so far as it has permitted the pipe used to be made in this country instead of imported. In the meantime it has furnished employment to a large number of people, has built up large works, and to all that extent has benefited and increased the wealth of the country. Continuing, Mr. Wanner said: "Such statements as the

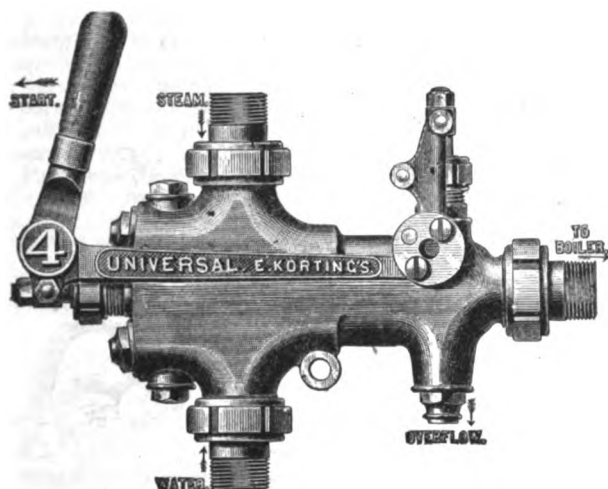


Fig. 3.—General View.

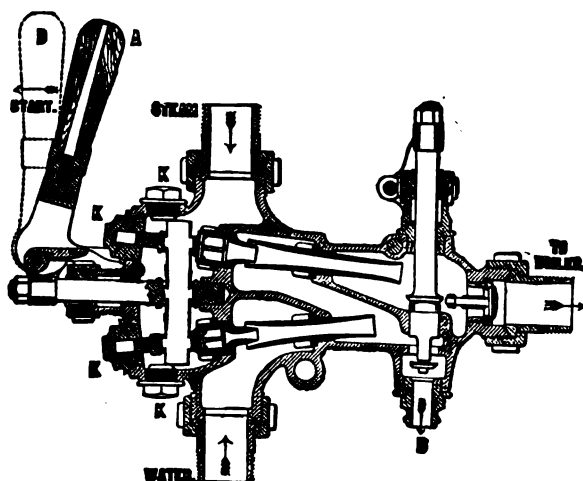


Fig. 4.—Longitudinal Section.

THE NEW STYLE KORTING DOUBLE TUBE INJECTOR.

new injector, we would add, is turned out in 16 sizes.

The Cast Pipe "Trust."

Peter D. Wanner, president of the Melkert Foundry and Machine Company, and of the Reading Foundry Company, among the largest manufacturers of cast-iron pipe in the country, has written a letter to United States Senator John R. McPherson, of New Jersey, denying the statement made by the latter in the Senate, recently, to the effect that the cast-iron pipe industry had formed a trust, under which the price was to cover the foreign cost, the duties and all expenses. Mr. Wanner says the assertion is unwarranted, and that not only has no trust been formed,

one above complained of might be permitted to go unnoticed were it not for the fact that they put the members into a bad light before the consumers, who believe that they pay too much for what they buy, and also with their employees, whom they lead to believe that they are not properly remunerated for their work." In closing, Mr. Wanner trusts Senator McPherson will withdraw the objectionable statement. As no attention was paid to the letter Mr. Wanner gave it out for publication.

A bill before the South Carolina Legislature assuming that some of those who are benefited by cotton fires on shipboard are responsible for them and arouses very bitter feelings among those interested.

NEW PUBLICATIONS.

ANNUAL REPORT, State Geologist (Vol. 1), on the Geological Survey of New Jersey.

The first of final series of reports by the Geological Survey of New Jersey has just appeared. It deals exclusively with the topography and climatology of the State, and refers at some length to magnetic survey. The report, which is the compilation of Prof. George H. Cook, the State Geologist, is accompanied by a handsome map showing the elevations of different parts of the State above tidewater.

THE LAKE SUPERIOR COPPER PROPERTIES. By Henry M. Pinkham. Printed for the Author, Boston. Price 25 cents.

Mr. Henry M. Pinkham, who is connected with the financial press of Boston, has lately published a pamphlet descriptive of the copper mining properties of Lake Superior, taking up in turn the financial history of every leading mine in that famous section. The record is one of which Lake Superior may well be proud, the total dividends of the copper companies since copper was first found, aggregating \$46,421,120. The details are submitted below:

RECAPITULATION.

Calumet.....	\$300,000
Hecla.....	650,000
Calumet and Hecla.....	29,900,000
Total.....	\$30,850,000
Atlantic.....	480,000
Central.....	1,890,000
Copper Falls.....	100,000
Franklin.....	600,000
Minnesota.....	1,836,000
National.....	320,000
Osceola.....	1,222,500
Pewabic.....	460,000
Phoenix.....	20,000
Pittsburgh and Boston.....	2,518,620
Quincy.....	4,710,000
Ridge.....	100,000
Tamarack.....	440,000
Total.....	\$46,421,120

The facts still remain, however, and to which Mr. Pinkham does not allude, that the sums of money sunk in unprofitable ventures since the discovery of copper on the Peninsula have been very large.

THE MINERAL RESOURCES OF THE UNITED STATES, by David T. Day, Chief of Division of Mining Statistics and Technology. Published by the United States Geological Survey, J. W. Powell, Director, Washington, D. C., 1888. Price, 50 cents.

The fifth volume of the mineral statistics of the United States, collected by the Geological Survey, has just been published, covering the calendar year 1887. In its general scope, and in the personnel of its compilers, it has remained largely the same. Mr. James M. Swank has furnished a chapter on iron, some parts of which have already been printed from advance sheets in the technical press. Mr. John Birkinbine, of Philadelphia, deals with iron ore mining in 1887, reviewing in detail the leading districts throughout the country. He quotes a good many new analyses, and furnishes considerable data, among others brief references to ore concentration. The chapters on copper, lead, and zinc have been written by Mr. C. Kirchhoff, Jr., while manganese, coke, natural gas, and petroleum are from the pen of Mr. Joseph D. Weeks, of Pittsburgh. By far the most extensive single contribution is that of Charles A. Ashburner, on coal, that, probably, being the most thorough collection of coal statistics yet attempted in the United States. Exclusive of the colliery consumption, Mr. Ashburner makes the total production of coal in the United States 130,000,000 tons, the colliery consumption being placed at 6,000,000 tons. Mr. Ashburner takes up State by State, and furnishes a wealth of detail which will prove particularly valuable. Among the other contributors are Mr. R. L. Packard,

on aluminium; Wm. C. Day, on structural materials; George F. Kunz, on precious stones; W. A. Ramborg, on salt, and A. C. Peale, on mineral waters. The special feature of the work this year is a list of useful minerals of the United States, edited by Albert Williams, Jr. The minerals are arranged by States, their mineralogical name and common name being given, as also the locality. While it is not claimed to be complete, it is certainly very elaborate and extensive.

FIFTH ANNUAL REPORT OF THE INSPECTOR OF MINES OF KENTUCKY.

The fifth annual report of the Inspector of Mines of Kentucky is at hand. The book gives information of the various railroad extensions, especially those reaching into the coal districts of the State. It shows that coal mining has increased very much over previous years, and that the condition of the mines is more satisfactory and safer. Various means and devices for labor-saving are illustrated, as well as the designs for ventilation and handling the coal after it comes to the surface. A careful description of all the works in the State is given, and various comparative tables, showing the high value of certain coals for steam and other purposes. The great lack so far is good coking coal, but this, it is said, will be completely overcome by the opening up of the deposits in the Cumberland Gap region; but whether this coke can be carried to the furnaces in Tennessee and Alabama at a profit to the ovens and cheap enough for the consumers remains to be proven. For the year 1887 Kentucky produced only about 2,000,000 tons of coal, Illinois 10,000,000, Ohio 11,000,000 and Pennsylvania 80,000,000, and yet it is asserted that Kentucky has more coal area than the great coal State, showing, if this is a fact, that coal mining is hardly begun there yet. The cannel coal of Kentucky is widely known for its gas-producing qualities, and in certain sections of the State it lies so as to be easily and profitably worked. During the first six months of 1888 over 23,000 tons were mined, and 20,000 tons were shipped to points out of the State.

A "Tower Building."

J. Noble Stearns, the largest silk manufacturer in New York, realizing the increasing demand for well equipped offices, has erected a 15-story building in the vicinity of the New York Stock Exchange, at 50 Broadway. This building presents a striking appearance, since, although it widens as it runs through to the next street, the width of the Broadway lot on which the front part of the building stands is only 21½ feet, and, as the adjoining buildings are only four stories high, the tower building towers, in every sense of the word, above the entire neighborhood.

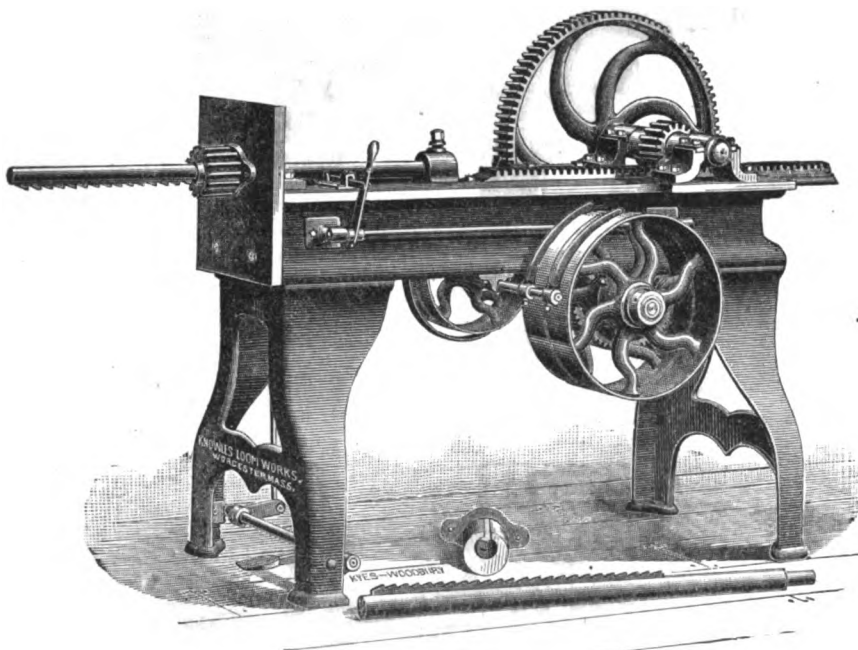
The interior arrangements of the building will be such as to make it a model office building. A series of pneumatic tubes will be so connected that messages may be sent to and from any floor in less than a minute. A mail chute will be placed on each floor so that letters may readily be dropped into the post-office mail box on the ground floor. The elevators will be of the Otis make. The entire building will be heated by a radically new method of steam heating, known as the Hussey reheater system, which reheats the exhaust steam and utilizes the reheated steam for heating; by this method the work can readily be accomplished by one boiler; two being required by any other plant.

There will be an improved electric light plant. The Hussey ReHeater and Steam Plant Improvement Company of 15 Cort-

landt street, New York, have the contract for placing the entire steam plant, including boilers, pumps, tanks, re-heater, steam pipes, radiators, &c. In order to economize room which is most valuable in that part of the city, the boilers will be placed under the sidewalk. Every room will have especially designed radiators, and the steam will be automatically regulated by an electric combination, therefore necessitating no attendance from occupants of offices. The building is entirely fire proof.

New Slotting Machine.

The Knowles Loom Works, of Worcester, Mass., are bringing out a new slotting machine, built in two sizes. The piece to be slotted is placed on a bushing upon a face-plate, and the slot cut by a single passage of the cutter in from 10 to 20 seconds. The slots may be made straight or of any taper required by a change in the bushing upon which the work is placed. One great



NEW SLOTTING MACHINE, BUILT BY THE KNOWLES LOOM WORKS, WORCESTER, MASS.

saving of time is affected by the use of this machine by the circumstance that the work does not have to be fastened to the machine, but is immediately brought to position and held by the bushing, through which the cutter passes. The same size of slot can be put into any number of different sized holes by means of eccentric bushings. Slotter No. 1 will cut a slot 6 inches long, ¼ inch wide, ¼ inch deep, and No. 2 a slot 12 inches long, 1 inch wide, ¼ inch deep, at a single passage of the cutter-bar. The machine will slot any piece less than 6 feet in diameter as it stands on the floor, and more than that by having a pit for the casing to swing in. Much larger slots can be cut by using two cutters, taking out a part of the stock with one cutter and finishing to proper size with a larger one.

Rand, McNally & Co., the well-known publishers, of Chicago and New York, will issue next month a new edition of their Indexed Business Atlas of the United States, Canada and Mexico. It will comprise in all 92 maps, corrected to date, to show new post offices and railroad stations. A new feature will be that each railroad will be shown in a distinct color. The price will be \$12.50.

The Standard Coins of the World.

Dr. James P. Kimball, Director of the Mint, has estimated the values of the standard coins of the various nations of the world, for publication January 1, 1889. The values of the gold coins have been ascertained by comparing the amount of pure gold in each with the amount in the gold dollar of the United States. The silver coins of countries having the double standard have been given the same valuations as the gold coins of such countries with which they are interchangeable. The values of the silver coins of countries having the silver standard have been ascertained by taking the bullion value of the pure silver contained in such coins based on the average price of silver in London for the period commencing October 1, 1888, and ending December 24, 1888—namely, 42.911 pence per ounce, British standard, equivalent, at the par of exchange, to \$0.94066 per ounce fine. The value of silver for the corresponding

period of last year was \$0.96645, a decline of a little over 2½ cents per ounce. The decline in the price of silver occasioned a change in the estimated values of the following coins:

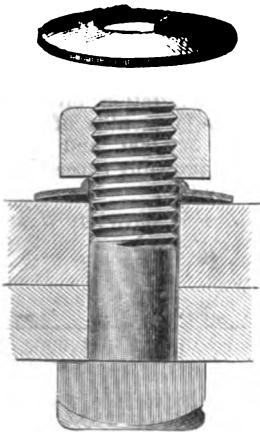
Coins.	Value Jan. 1, '88.	Value Jan. 1, '89.
Florin, of Austria.....	\$0.545	\$0.536
Boliviano, of Bolivia.....	0.699	0.680
Sucre, of Ecuador.....	0.699	0.680
Peso, of Guatemala.....	0.699	0.680
Peso, of Honduras.....	0.699	0.680
Rupce, of India.....	0.332	0.323
Yen, of Japan.....	0.753	0.734
Dollar (Peso), of Mexico.	0.759	0.739
Peso, of Nicaragua.....	0.699	0.680
Sol, of Peru.....	0.699	0.680
Rouble, of Russia.....	0.559	0.544
Nahhub, of Tripoli.....	0.630	0.614
Dollar (Peso) of U. S. of		
Colombia.....	0.699	0.680
Bolivar, of Venezuela....	0.140	0.136

Shipbuilding in Maine continues depressed, although that State still holds the supremacy in turning out wooden vessels. During the year there have been built 54 vessels of all rigs, aggregating 16,173 tons, against 41 vessels, with a total of 17,454 tons, built in 1887. At Bath, the principal wooden shipbuilding port and the largest in the world, there have been built 24 vessels, with a total tonnage of 10,035, against 20 vessels, aggregating 10,319,

built in 1887. There were built 18 schooners, with a total of 8524 tons; 5 steamers, 855 tons, and 1 bark of 555 tons. At East Boston, Mass., there has been more activity than before for many years, the demand being for schooners in the coast-wise trade.

Improved Lock Washer.

A year or two ago we had occasion to present to our readers a description and illustration of a simple and effective lock washer brought out by the National Lock Washer Company, of Newark, N. J. The principle of the washer was applied in two different forms, one being intended for heavy work, as for example, in connection with track bolts, heavy machinery, &c., and the other for lighter work, and also for use in securing carriage bolts and in connection with wood and metal work in general. This latter form was a dished spring washer, provided with a rib extending entirely around its inner edge, and projecting outward, so as to act on the face of the nut, which was screwed down upon it, so that, on the washer being flattened out against the surface of the work through which the bolt was inserted, a portion of



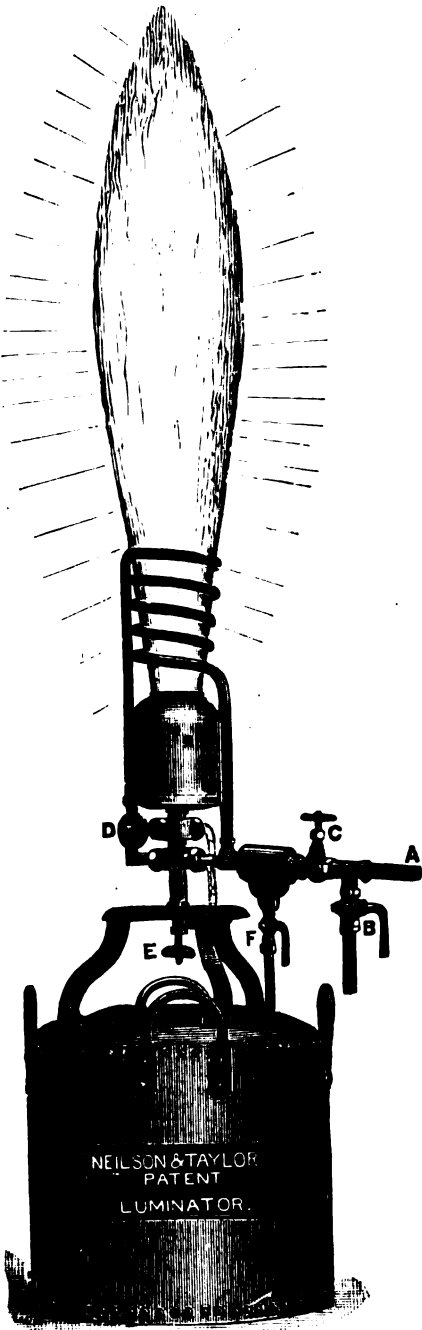
Improved Lock Washer for Woodwork.

the metal of the nut was forced against the bolt, effectively locking the nut and guarding against its working loose.

Since then the Company have made some improvements, which are embodied in the washers shown in the annexed engravings. The principle has been retained, but it will be noticed that the inner edge of the dished washer, instead of being provided with the previously mentioned rib, has two projections, which are spirally inclined in the opposite direction from that of the threads on the bolt. By this arrangement these projections perform the displacing function upon the metal of the nut as the latter is screwed home. The pressure with which the dished washer bears upon the surface of the work while the nut is being screwed on is in the new arrangement greatly diminished, and the adaptability of the washer is therefore much increased for employment with nuts and bolts used in wooden structures, as there is a diminished tendency of the upper edge of the washer to indent itself into the wood. The importance of this point will be readily appreciated. The smaller of our engravings shows a partial top view of the washer, with the displacing projections clearly defined. The larger of the cuts represents a washer in position, with the nut ready to be screwed down upon it. From the engraving it can be understood with little difficulty just what will happen when this is done. The washers, so far as we know, have given excellent results since their introduction, and are turned out, we understand, at a relatively low cost.

A Steam Lamp.

Messrs. Lean & Blair, of Pittsburgh, Pa., are putting on the market what will be known as the improved "luminator," and which, in effect, is a steam lamp for burning cheap creosote and other heavy non-explosive hydro-carbon oils in conjunction with steam or air. We understand that it gives an intense, white flame, shedding a great amount of light, and is, accordingly, recommended as a most suitable and



Steam Lamp, Made by Lean & Blair, Pittsburgh, Pa.

economical light for foundries, boiler sheds, engineering works, shipbuilding yards and other similar establishments.

The manner in which this lamp works will be understood without much explanation, the construction being simple and the engraving quite clear. We may say right here that either compressed air or steam may be used, the results in either case being eminently satisfactory. The steam or air supply pipe is connected at A and the drain cock B is opened until steam or air passes freely. The cock is then closed and the valve C opened wide, allowing steam to pass through the luminator. The quantity of steam or air is regulated

by the valve E, giving a little to begin and then increasing or diminishing the quantity as required. The oil supply is regulated by the valve D. If the oil gets thick and cloggy by frost, the cock F should be left slightly open, so as to allow a small drip of water to pass, and so heat the oil by the pipe passing through the tank. The cock F should be shut off if the oil is getting too hot. The oil tank should be washed out with hot water occasionally by plug C. To put out the light, shut off steam or air at C, and open F.

The light is under perfect control and requires no skilled attendant. The lamp can be lighted or extinguished instantly. The consumption of oil varies from about 1.6 to 2 gallons per hour.

A Record of the Smith Heating Furnace.

We are indebted to Alex. Laughlin & Co., of Cleveland, for the following record of the product and fuel consumption of a 7 x 16 foot Smith heating furnace recently completed by them with the necessary gas producers at the works of the Ohio Iron Company, Zanesville, Ohio, under a guarantee as to fuel consumption:

Size of Bar.		Weight of Finished Iron.	Hoppers of coal used, at 76 lbs.
1888.			
Dec.	4 2 1/4 x 3/4 in., flat.....	12,295	35,677 65
	5 2 1/4 x 3/4 in. ".....	23,850	36,145 61
	5 2 1/4 x 3/4 in., guard.....	25,025	
	6 2 1/4 x 3/4 in. ".....	11,335	36,360 64
	6 1 1/4 in., round.....	5,519	
	7 1 in. ".....	5,635	
	7 1 1/4 in., square.....	14,520	
	7 1 1/4 in. ".....	12,330	38,004 61
	7 1 in. ".....	5,660	
	8 1 1/4 in., round.....	3,010	
	8 2 1/4 in. ".....	2,815	
	8 2 1/4 in. ".....	2,060	
	8 2 1/4 in. ".....	1,400	
	8 3/4 in., round, steel.....	1,230	
	8 4 in. ".....	5,685	
	8 1 1/4 x 3/4 in., flat.....	945	
	8 1 1/4 x 3/4 in. ".....	2,450	
	8 1 1/4 x 1 1/4 in. ".....	975	
	8 2 x 1 1/4 in. ".....	730	27,860 57
	10 2 x 1 1/4 in. ".....	14,570	
	10 2 x 1 1/4 in. ".....	9,515	
	10 2 1/4 x 1 1/4 in. ".....	7,170	
	10 2 1/4 x 3/4 in. ".....	10,625	41,870 63
	11 2 1/4 x 3/4 in., round.....	12,122	
	11 1 1/4 in. ".....	18,120	
	11 1 1/4 in. ".....	5,880	36,122 54
	12 2 1/4 x 3/4 in., guard.....	28,323	
	12 1 1/4 in., round.....	11,876	40,199 60
	13 1 1/4 in. ".....	10,395	
	13 1 1/4 in. ".....	5,830	
	13 1 1/4 in. ".....	14,645	
	13 1 1/4 in. ".....	1,435	32,305 66
	14 3 x 3/4 in., flat.....	19,470	
	14 3 x 3/4 in. ".....	1,400	
	14 3 in., flat.....	7,130	4,0600 62
Total.....			365,142 613

This 182 1/2 tons finished iron with 46,588 pounds slack coal, making an average of 255 pounds to a ton of finished iron.

The coal used costs but 62 1/2 cents per ton delivered at the works, or 8 cents for each ton of iron heated, and the wages of the gasmaker cost \$1.65 per day, or about 7 1/2 cents to each ton of iron heated, making a total cost of 15 1/2 cents per ton, which is believed to be somewhat lower than any of the natural gas companies are charging. The iron was rolled on a 16-inch two-high bar mill, while a great deal of it should have been rolled on a 10-inch three-high mill. There was no telegraph from the furnace to the rolls, so that all the iron had to be run down on a buggy. These disadvantages together make it impossible for the rolls to take all the iron which the furnace could heat, and at the same time there was not a man about the furnace who had ever worked a gas furnace before.

THE WEEK.

Philadelphia is discussing the expedience of buying an electric lighting plant, which it is claimed would reduce the cost per lamp to about 17 cents, instead of about 50 cents per lamp, as at present. The plant would cost \$120,000.

The Governors of eight of the largest Southern States have, in compliance with a request from C. H. Wells, filled up blanks with official figures showing the progress made by the respective States during the last eight years. Georgia and South Carolina alike show the greatest increase in manufacture of cotton. In iron making Georgia also shows wonderful progress, and diversified small industries have been fostered with excellent results. Alabama's largest increase is in iron, with lumber, coal and quarrying close behind. In the line of manufacture Texas has shown the greatest increase in the making of iron and the converting of it into useful articles. Lumber comes second, flour milling third, with canned fruits next. In lumber manufacture Arkansas has made the greatest headway since 1880, cotton oil making coming second and mining third. Virginia's growth has been in the line of iron working and mining, as well as lumber cutting, wood working, and flour milling. In respect of assessed valuations Texas shows the largest gain, equal to \$354,600,000 in eight years. Alabama comes next with a net gain of \$92,039,000. Adding all the figures together the gross gain in eight States in eight years is \$794,900,000.

Lumbering in the Dominion has suffered a collapse since the election in the United States, enormous accumulations having been made in anticipation of free exports. The reaction is intensified by the imposition by the Government of an increased export duty on pine logs. Several American firms who bought timber on Georgian Bay in expectation of rafting the logs across the lakes to Michigan are severe sufferers.

The growing importance of steamship lines in the coastwise trade appears in the single fact that there are now five steamers a week between New York and New Orleans and at least 20 steamers are plying between New Orleans and Central America. Ten years ago there was barely one. In trade with Cuba and Mexico there is an equal growth.

The construction of the Naval Observatory at Washington City will be commenced in the spring.

New York manufacturers of domestic woolen goods about a year ago subscribed \$30,000 for the services of a special agent to be stationed at the custom houses to assist in the prevention of fraudulent valuation, and the report just made of the results causes much dissatisfaction among importers. Complaint is made with good show of reason, and it is claimed "that no agent of any domestic manufacturer ought ever to be allowed to handle the goods or to inspect the invoices of the importers. Experts should be employed, but they should be the sworn officials of the Government, and under no circumstances should the trade secrets thus laid bare to them be exposed to public gaze, much less to the rivals of those who own the goods."

The continued depreciation of silver works mischief in the trade of Mexico. When the Mexican dollar, worth intrinsically more than the Bland dollar, gets down to 73 cents in New York, as at present, and silver bars are quoted at 42½ in London, many important interests are seriously affected. A Mexican correspondent says: "Mexico is now importing \$50,000,000, silver value, of foreign goods, some \$26,000,000 of which comes from Europe and \$24,000,000 from the United States.

To meet this big bill she exports products other than silver about \$18,000,000 according to recent figures. The balance of \$32,000,000 goes out in silver. It is this condition of affairs which the united chambers of commerce of the country, combined in one association, known as the Mercantile Confederation of the Republic, are studying with great care. The confederation has been holding sessions during the past three weeks, and has, in a series of reports, gone into the matter with a boldness which will compel the Mexican people to stop and think seriously. The reports urge that the true remedy for overcoming the evil results of the continual drop in silver is to export more and more of products which, in relation to gold, the universal measure of values, have not depreciated, while some have risen, as for example, henequen and coffee."

The great work contemplated in the excavation of the Cape Cod ship canal at Sandwich, Mass., is the severance of the far-reaching peninsula from the main land, shortening the inside route from Boston to New York 76 miles, and the outside route 130 miles. During the last year nearly one mile was dug by a single steam dredger operated by 12 men, not quite seven miles remaining to be cut through. When finished, the canal will be 200 feet wide on top, 75 feet on the bottom, with an average depth of 23 feet at low water. There will be no locks.

Andrew Carnegie, the "Iron King," is said to have made his first big money in the oil business. He was one of the principal owners of the Story farm, on Oil Creek, Pa., which is estimated by practical oil men to have produced in the 20 years since the first discoveries were announced oil to the value of \$9,000,000 to \$10,000,000. In a single year the production of the farm was 141,508 barrels.

Philadelphia editors are now confident that the proposed improvement of League Island, as the site of a naval station, will be carried into execution. The cost will not be less than \$4,000,000.

Germany and England vie with each other in supplying Brazil with machines and machinery. A Berlin paper expresses dissatisfaction that their British rivals have acquired such an advantage, and recommends the exporters at home to keep the importers in Brazil well supplied with catalogues illustrative and descriptive, and lists of the German manufacturers' prices printed in either the Spanish or Portuguese languages, or both. They are also recommended not to attempt to deal direct with the Brazilian shopkeepers, but through German commission houses, who are able and willing to obtain good orders at a small commission and free of all risk to the manufacturer by the sole assistance of samples, catalogues and price lists. Goods should also be packed very strongly, and into as little space as possible. Americans may profit from these hints.

A strong effort will be made in the next Congress to provide for a deep water port on the coast of Texas, the location to be selected by a commissioner.

The City of Mexico is negotiating a loan of \$10,000,000 in London, for the purpose of carrying into execution the plans for building a great drainage tunnel, introducing water and improving sewers, upon which engineers have been engaged for some time past.

The net debt of the State of New York is less than \$3,000,000, there being \$4,000,000 in the Sinking Fund.

Electricity for car propulsion is gaining favor in this city. In Fulton street, east of Broadway, may be seen a section of the new cross-town electric railway. The current will be conveyed to every car from

the powerful dynamo at Burling Slip by means of two parallel copper bars suspended a few inches beneath each rail. A direct and constant connection will thus be maintained between the source of power and the car through a narrow slot which permits the free movement of a conducting rod. The Fourth Avenue line promise to have a dozen of the Julien electric cars running before the close of the winter.

The more general use of natural gas in Ohio and Pennsylvania has necessarily driven a large amount of bituminous coal out of those States to more distant markets.

It is a curious fact, if it be one, as now affirmed, that labor organizations as a whole, during a long term of years past, have not secured for themselves a higher rate of wages than is realized by workmen who have remained independent, seeking for themselves individually such compensation for their services as they might be able to command through an equitable agreement with the employer. Considering the enormous amounts of money that have been expended by associated workmen in maintaining organizations and aiding those of their fellows who went out "on strike," the practical operation of the two systems of labor, as thus indicated in results, affords a lesson of the deepest significance. It demonstrates yet again the difficulty of running counter to natural laws governing supply and demand throughout the whole realm of mundane affairs.

Foreign immigration into the United States during 11 months of 1888 did not quite reach 500,000, and the total for the year will probably exceed that of 1887 only about 10,000.

Commissioners have left Washington to locate a navy yard on the Pacific Coast above the 42d parallel.

The new city hall in course of erection in Richmond, Va., is of James River granite and will cost \$700,000. The population of the city is about 85,000.

Sales of real estate in Tacoma, W. T., during the year amount to \$8,250,000 and the boom is still on.

The East River Bridge has become a wonderful thoroughfare, in this respect repeating the experience of the elevated railroads, the business done exceeding by far anything that the most sanguine predicted. The aggregate number of passengers for the year was 33,116,000, showing an excess of 2,500,000 over the previous year. The receipt from tolls amounted to \$917,961, of which sum the railroad yielded \$833,700.

Work on the steel and iron railroad swing drawbridge which the Stonington and Providence Railroad Company are now swinging across the Thames River at New London will be somewhat delayed by the loss in Long Island Sound of a timber raft which had been towed from Georgia through the canals.

Many railroads are projected or in course of construction on both banks of the Hudson, in the vicinity of the Poughkeepsie Bridge. Among them are the eastern connections to the bridge, a line from Campbell Hall to Highland, one from Greycourt to Burnside, the Newburg and Wallkill Valley Line, the road from Brewsters to Anthony's Nose Bridge, and one from Fort Montgomery to Turners.

The long-continued depression in the raw silk market and the recent rise may make a synopsis of this market for some years back interesting. On June 30 of last year, which was the end of the season, stocks of raw silk in every country were smaller than ever before. The new crop in Canton showed a shortage of 55 per cent. Canton usually exports 20,000 bales to Europe and America. In Northern

China, which includes Shanghai, there was a deficiency of from 20 to 25 per cent. Italy showed a loss of from 15 to 20 per cent. At the end of October, 1888, the lowest price of the century ruled on all grades of silk. At that time a syndicate was formed in Italy which was composed of silk merchants and bankers, and the price was forced up about 25 per cent. In October of 1888 prices reached a lower basis than ever, and early in December of that year some leading houses in London, Lyons and China, who are heavy importers and exporters of raw silk, commenced to operate, and to this is partly due the recent advance.

The Persian Government has issued a decree prohibiting the construction of works with foreign capital, which does not tally with the spirit of recent utterances of the Persian Minister at Washington.

Fifteen thousand employees of the Panama Canal Company are liable to become destitute and desperate in case their resources are cut off for any reason, and, as many of them are almost savage Liberians, fears are entertained that hunger may drive them to pillage and destruction. According to the terms of agreement between the Government at Bogota and the canal company the entire plant, including railroad, shops, land and, in general, all property connected with the work of construction, are forfeited to the "concessionaires" without indemnity of any kind, in case the scheme is either abandoned or transferred to "any foreign government or nation."

The long-pending contest between the Dominion Government and the Province of Manitoba has ended in a decision by the Supreme Court, rendered unanimously, that the province has a right to authorize the construction of lines across the lines of the Canadian Pacific, the only condition being that the mode and place of crossing shall be approved by the Railway Committee of the Dominion's Privy Council. Manitoba henceforth will be untrammelled in reaching out across the boundary for closer commercial connections with the United States, with the special object of gaining an outlet for its stores of grain. The Canadian Pacific, on the other hand, is thwarted in a quarter where obstructions were least expected.

Several million dollars have been withdrawn from Connecticut savings banks during the year for investment in Western mortgage securities.

The wire rigging of the great five-masted schooner Governor Ames came down with a crash during a heavy blow, the ends of the wire having been cut too short in splicing, and all of the masts went overboard.

The Mexican Government is removing obstacles to the export trade of that country so far as possible in an effort to encourage the largest expansion.

Engineer Merrical, of the Nicaragua Canal Company, says a newly discovered mountain route will cost \$15,000,000 less than previous estimates, and discharged Panama Canal men can be had at 75 cents to \$1 per diem.

The Cincinnati Tin and Japan Company, owing to the steady growth of their business, have been compelled to seek larger quarters, both for manufacturing and trade purposes. This object was accomplished in securing the premises 174 and 176 Main street, between Fourth and Fifth streets, consisting of two pressed brick buildings of five stories each, having a frontage on Main street of 40 feet, running back 160 feet to the alley, on the opposite side of which is an additional building 25 x 50 feet, three stories high, this latter will be

used for manufacturing purposes exclusively. The basement of the main buildings will be used for the storage of Hollow-Ware, Refrigerators, Gasoline Stoves, &c., the first floor will contain a complete stock of Tin Plate and Sheet Iron, the offices will also be located on this floor; the second floor will be fitted up in an attractive manner as a sample-room, and where Stamped Ware will be kept. The third floor will be devoted entirely to Box Goods and Japanned Ware; the fourth floor, storage for Pieced Tinware, and the fifth floor will be used as a shop. On this floor and in the factory building already referred to, will be produced all the Japanned and Pieced Tinware, Sheet-Iron Goods and Solder, for which the firm enjoy an excellent trade. Broad stairways provide access to the various floors, which are in turn well lighted by means of extra large skylights. Two hydraulic elevators provide means of transportation of the heavier articles from floor to floor.

A Large Sand Wheel.

A dispatch from Scranton, Pa., under date of the 19th ult., says: "The largest wheel of the kind ever made in this country, and probably the largest of any kind, is now in course of construction at the machine shop of the Dickson Mfg. Company here. It is what is called a sand wheel, and is being made for the Calumet and Hecla Copper Company, of the Lake Superior region. The great wheel will be 53 feet in diameter and several feet wide, and the Dickson Mfg. Company will get \$70,000 for it. It is being built around a 20-inch hollow shaft of gun-metal, and it will weigh between 150 and 160 tons when completed.

When the great wheel is put in place at the copper mines it will be made to revolve slowly by means of enormous cogs on the surface of its circumference. These cogs are being cast in segments, and will weigh many tons in the aggregate. On each side of the mammoth wheel there will be 50 buckets, each of which will hold about 100 gallons, and these buckets will elevate the washings and dump them into a sluiceway. After the great wheel has been built up and all the finishing touches have been put on, it will be taken apart and shipped.

The first of the calendars from the Metal trade to reach us this season is one from Bruce & Cook, 186 Water street, New York, and its simple and tasteful design will be pleasant to look back upon from the midst of the over-ornamented and gorgeous productions that will in all likelihood come to us for notice during the next few weeks. The calendar is similar to those issued in former years by this firm. It is a nearly square piece of heavy white cardboard, edged with a broad band of fine scroll-work in black and red. Across the top is the firm's name and business, printed in large, plain type, and the months are paneled off in columns down the sides. In the middle of the card is a wood-cut representing the front and rear elevations of the firm's warehouse on Water and Pearl streets, while above and below the illustration are lists of the metals and goods kept in stock. The cut is evidently new, and though a great improvement on the one formerly used, its execution is hardly in keeping with the other decorations of the calendar. Messrs. Bruce & Cook are among the oldest houses in the American Metal trade, the dates 1812 and 1889, which are given a prominent position on the card, indicating the length of time the firm has been in existence. Accompanying their calendar Messrs. Bruce & Cook send a New Year's greeting to the trade in the form of a circular letter. After referring to their extensive line of goods and the saving in

shipping charges and freights to the purchaser who buys his goods in one lot, the circular presents the following review of the Metal markets during the past year: "The reaction from high prices of metals, to which we referred last year, came during the spring months, and since that time lower prices have ruled, except for Copper and for a short time in Pig Lead. The former still holds at a fictitious value owing to the operations of the syndicate, who have been successful, up to the present time, in maintaining a price not warranted by the ordinary conditions of supply and demand. The latter, by a vicious method of speculation, was forced during the early autumn above 5¢ $\frac{3}{4}$ lb, from which it dropped suddenly, owing to the inability of speculators to carry; and in its fall crushed the leaders in such unwarrantable operations, and is now ruling at a fair market rate.

Opalescent Glass.

C. Edward Henry, formerly of New Rochelle, N. Y., has just put in operation the Opalescent Glass Works, at Kokomo, Ind., for the manufacture of glass for decorative purposes. The location was chosen to take advantage of the natural gas found in that vicinity, which is furnished free to manufacturers. The works consist of a modest brick factory, containing a seven-pot furnace, a reheating furnace and annealing furnaces. The chief product of the works is drapery glass, now extensively used in this country for ornamenting windows. *Scribner's Monthly* for December contains an article on the uses to which this glass has been put, the writer claiming that our artists and decorators are now producing effects in stained glass windows far superior to the best work of European artists. He describes part of the process of manufacturing drapery glass as follows: "This is made from the glass as it is thrown in a melted state upon a flat table of iron to be rolled into a disk. When the glass is spread out, very much like pie crust, the roller by which it is spread keeping up the resemblance, the edges are seized by the glass maker, armed with short tongs, who overlaps an edge, or pulls and twists it in various directions as his fancy may suggest. This glass, when annealed and cooled, reveals in great variety the flow and twist of folds of drapery, and when the artist artisan, with the main direction of the lines of the draperies of the cartoon which he is following firmly fixed in his mind, visits the racks in which, row upon row, the disks of glass are stored, he is generally able to select pieces which, placed in the window, represent in the color of the glass, unaided by the painter's skill, the most subtle gradations of light and shade in the form of the drapery." The method in which the glass is colored is kept secret. The coloring matter used operates very singularly on the glass, being deep in some places, and fading in an irregular manner to the lightest tints. It is sometimes mottled and again very evenly disseminated. Some of the plates of glass have a very smooth surface, like window glass, while others are full of corrugations and waves. The plates as finished are about 2 feet square, and are sold by the pound. Mr. Henry's warehouse, adjoining the works, is a most fascinating place for a student of color. The plates are arranged in racks, classified by colors as nearly as possible, but hardly any two plates are precisely alike when held up to the light. The demand for this glass is large and constantly growing, the works in question having orders far beyond their capacity. Mr. Henry also manufactures glass insulators for incandescent electric lights. These are made in a press, in which molten glass is forced into the desired shape by suitable dies and molds.

MANUFACTURING

Iron and Steel.

The puddling department of the Norton Iron Works, at Ashland, Ky., that has been idle for the past two years, was started on December 17 on a contract for muck bar that will make steady work until March 1. The blast furnace is turning out its usual quantity of American Scotch pig iron, and the nail factory is in operation.

Cherokee Furnace, at Cedartown, Ga., out of blast for relining and repairs since July last, will resume operations early in the spring.

The Waugh Steel Works, of Belleville, Ill., are manufacturing steel rails, billets, slabs and nails. The company have also recently commenced the manufacture of steel shafting of all the different sizes, besides squares and flats. They have been running very successfully on soft steel, for which they find a ready sale. The company also manufacture all sizes of steel rails from 12 pounds to 35 pounds. They are constantly making additions to their works as fast as the demands of the trade require.

The United States Iron and Tin Plate Company, Limited, of Demmler Station, Pa., are contemplating the completion of a small new addition to their works. The building was commenced about a year ago, but was not finished on account of the uncertainty of the Tariff laws.

On Monday, the 24th ult., the Pottstown Iron Company, of Pottstown, Pa., closed down the nail department of their plant, and paid off and discharged all the employees. The average time made during the past month has been about ten days. The company complained that they were not making any money in nails, and about three weeks ago suggested that the men should agree to a reduction of wages for themselves. No action was taken by the men; hence the action of the company. It is thought the company will now fix a lower rate of wages, and resume with men who may accept it.

Macungie, Pa., Furnace, which has been undergoing repairs since July 1, is about completed, but will remain idle subject to a more favorable market.

A press dispatch from Steubenville, Ohio, under date of the 26th ult., says: "James F. Daton, receiver of the old Mingo Iron Works, which failed in 1879 with a large indebtedness, to-day declared the second dividend to the creditors. There were claims amounting to \$286,000 presented to the receiver, the heaviest one being by Singer, Nimick & Co., of Pittsburgh. Upon this amount the receiver has declared a dividend of 1 1/2 per cent. This is all the creditors will ever receive, as the settlement of to-day is final. The receiver has been discharged."

The blast furnace of Isaac McHose & Son, at Norristown, Pa., chilled on Monday, the 24th ult., and was blown out. It will be repaired and relined and put in operation again as soon as possible.

After an idleness of six months, during which complete repairs were made, Marshall Furnace, at Newport, Pa., will begin work on the 10th inst.

On Wednesday, the 26th ult., the Altoona Iron Company, of Altoona, Pa., declared its usual annual dividend of 10 per cent. on their capital stock of \$100,000.

From the Vermillion Iron Tribune of a recent issue we take the following: "A new iron company has been formed, to be known as the Vermillion and Grand Marais, with headquarters at Duluth. Their capital stock is \$5,000,000. The

incorporators are Hiram W. Sibley, New York; Henry M. Loud, Oscoda, Mich.; David S. Fox and Charles S. Brown, Flint, Mich.; Isaac Bearinger, East Saginaw, Mich.; George L. Walker, Detroit, Mich.; James Charnley, Chicago; Moses Stewart, Jr., Verdale, Minn.; William McKinley, Frederick W. Paine, Horace Williston and George T. Hughes, Duluth. The company own lands on the East Vermillion and also the Messaba. The company have in their possession between 12,000 and 15,000 acres of land, much of it first selections and containing many rich and very valuable iron outcroppings. It is scattered over the entire range. Officers and directors have been selected as follows: Henry M. Loud, president; M. Stewart and Wm. McKinley, vice-presidents; F. W. Paine, treasurer, and Horace Williston, secretary."

J. M. Coleman, of Niles, Ohio, has closed a contract with the Cherokee Land and Iron Company for the erection of a large and entirely modern rolling mill at New Birmingham, Ala. It is expected that a portion of the machinery will be on the ground within 30 days, and that the mill will be in full operation by next spring.

No. 1 of the Maryland furnaces, at Baltimore, having a monthly capacity of 600 tons, will go in blast about the middle of February, simultaneously with the blowing out of No. 2 for a new hearth.

We are authoritatively informed that the report that the plant of the National Tube Works Company, at McKeesport, Pa., would be closed down in the near future for an indefinite period is without foundation.

M. V. Smith, metallurgical engineer, of Pittsburgh, is constructing several new rolling mills in different parts of the country, including the mill for the Minnesota Car Company, at Duluth, Minn.; the mill for the Standard Spike Company, at Manchester, Va., and the mill for the Union Steel and Iron Company, at St. Joseph, Mo.

A change will shortly be made in the firm known as the Katahdin Charcoal Iron Company, at Katahdin, Me. Fred. W. Hill and Charles D. Sanford have bonded the controlling interest in the Katahdin Charcoal Iron Company, and will soon complete the purchase and assume the full management of the works and run them to the extent of their capacity. They will secure a lease of the Piscataquis Iron Company, which owns the plant and the township, to continue 50 years. The capacity of the work is about 25 or 30 tons per day, and the iron, as is well known, is of the very best quality. It is largely coming into use for car wheels, and the fact that the Canadian Pacific railway is to pass near the works, and that it is intimated that they will establish a foundry there for making car wheels may give the works one of the greatest possible booms in the near future.

The Millerton charcoal furnace, at Irondale, N. Y., blew out on Thanksgiving day, its resumption depending on future developments in the iron trade. In the meantime a new hearth will be put in and general repairs made.

From a recent issue of the *Age of Steel*, St. Louis, we take the following: "The St. Louis Ore and Steel Company are preparing to start their blast furnaces, and may finally follow with the steel works, though that depends upon circumstances. The company have over 100,000 tons of ore at their Pilot Knob Mine, and the idea is to turn this into iron. The ore is not sufficiently high grade to make the marketing of the resulting iron profitable at a distance, for instance, in Pittsburgh, and it is therefore very probable that the

steel plant will be reopened should the rail market improve. In that event the Jupiter blast furnace, though controlled by another corporation, would likely go into blast also, as its output would be needed to supplement that of the stacks at the steel works. "C" furnace at the latter place is expected to blow in early next week, and a second stack shortly thereafter."

On Friday the 21st ult. work was commenced on the erection of a large wire rod mill, at New Castle, Pa. The capital stock of the new company is \$150,000, all of which it is stated has been passed in. The proposed buildings will cover 4 acres of ground just east of the Crawford furnace, and will turn out about 150 tons of rods per day. President William Patterson, of the National Bank of Lawrence County, and other capitalists of New Castle and Pittsburgh are interested in the new concern.

Machinery.

H. K. Porter & Co., Limited, of Pittsburgh, manufacturers of light locomotives, are making an engine for display at the Paris International Exhibition, which opens May 5, 1889. The locomotive is especially designed for use on the coffee and sugar plantations of South America and the East Indies. On the 1st ult. this firm shipped to the Argentine Confederation, South America, six locomotives to be used on rural railroads near Buenos Ayres. The contract was received after close competition from English locomotive works.

The Crescent Foundry Company, Limited, have been organized at Pittsburgh, with a capital stock of \$5000. The company is composed of Louis Weitheimer, Jacob J. Kish, William C. Kish and Louis M. Kish.

The National Wrapping Machine Company, of Pittsburgh, have contracted with Bair & Gazzam, Limited, of that city, for the construction of ten soap-wrapping machines.

The Emerson Mfg. Company, of Lawrence, Mass., are to erect a new shop 150 x 40 feet and one story high for the manufacture of paper-making machinery.

The Youngstown Brass Works, John W. Morrison, proprietor, have recently been established at Youngstown, Ohio, for the manufacture of brass and bronze castings, tuyeres &c. They report that they are already receiving a liberal share of the trade.

Bids were opened at the Navy Department on the 27th ult. for machine tools for the Mare Island, Cal., Navy Yard, under an appropriation of \$100,000 for the purpose of fitting the yard for the repair of steel ships. There were 49 items, the principal one being a set of bending rolls, for which the Niles Tool Works made the lowest bid, \$40,290.

The James E. Thomas Company, founders, of Newark, Ohio, cast recently the fourth of a number of large band-wheels they are making for Corliss engines. Its dimensions were: Diameter, 16 feet; bore, 10 inches; rim, 36 x 4 1/2 inches. Its weight was 29,400 pounds. It was cast in one piece, and afterward cut in two for shipment, being provided with lugs for bolting together again.

B. F. Sturtevant has removed from his old salesroom, at 115 Purchase street, to much larger and convenient rooms at 34 Oliver street, corner of Franklin street, Boston.

The Collins-Gibbons Mfg. Company, of St. Louis, purpose at an early date to put in the necessary machinery and increase their force sufficiently to make four sizes of their automatic wire straighteners and cutters.

Hardware.

The Painesville Metallic Blind Company, Painesville, Ohio, O. G. Tuttle and C. C. Finneran, proprietors, recently moved into their new building at the corner of Elm and Railroad streets. This building is two stories high, 60 x 26 feet, with an L 16 feet square, which gives it a frontage of 42 feet on the railroad. Last March this firm bought out the business interest of Wilson & Reed in the manufacture of metallic binding, and have since then been constantly increasing their trade.

I. A. Weston & Co., Syracuse, N. Y., whose works were nearly destroyed by fire December 4, are rebuilding at Jamesville, N. Y., seven miles south of Syracuse, where they will have largely increased facilities. They refer to their business in their patent steel wheels as having developed into large proportions, many of the leading manufacturers of tricycles, velocipedes, hand carts, garden plows, wheelbarrows, &c., having adopted their wheels.

The Rock Island Knife and Shear Co. have removed their plant to Kokomo, Ind., to take advantage of the natural gas. Their facilities in their new location have been largely increased.

Ford & Co., late of Cory, Pa., have just commenced the foundry business at Kokomo, Ind., and report orders ahead.

The shipping, polishing and machine departments of the works of E. T. Fraim, Lancaster, Pa., were damaged by fire on the evening of the 24 ult. Mr. Fraim, however, announces that in two weeks he will be again in full operation.

The Rockford Bit Works, formerly at Rockford, Ill., are now in full operation at Kokomo, Ind. They employ about 40 hands.

It is reported that Wilkins Linhart has been appointed receiver of the property and effects of the Hollis Tack and Nail Company, Limited, at Pittsburgh.

Local barb wire manufacturers are exceedingly well supplied with orders, the season considered. The Freeman Wire Company reported a week ago that they were 400 tons behind demand, and the American Company at that time were 300 tons behind, after having depleted, to the point of exhaustion, all stocks in their warehouse. The Continental Wire Company cleaned out their stock some weeks ago. The Southern Wire Company restarted this week with a full force of hands. The last named had received from and disposed of a considerable surplus of wire made at Braddock, near Pittsburgh, until this was sold their local works were run only in a light and irregular way. Prices, however, have ruled extremely low all through the year, and are a prolific source of complaint among manufacturers. —*Age of Steel, St. Louis.*

Miscellaneous.

The wire nail factory of the Hartman Steel Company, at Beaver Falls, Pa., which has been idle for several months, has resumed operations, on double turn.

P. J. & C. A. D. Lynch have just commenced the manufacture of steam boilers at Kokomo, Ind. Their shops, which are substantially built, are 60 x 120 feet, with cupola of 75 feet. They will be known as the Kokomo Steam Boiler Works.

Michigan Stove Co., Detroit, Mich., have decided to still further improve the appearance of their works by the addition of an ornamental iron railing to go around the top of their mammoth buildings, and have contracted with E. T. Barnum, Detroit, for the work.

A circular has been issued announcing that owing to a large extension of manu-

facture the Avery Elevator Bucket Company, of Cleveland, Ohio, have considered it advisable to change their name to the Avery Stamping Company. They will continue to make seamless steel elevator buckets a prominent feature of their business.

The Williamson Trade School.

The keynote of Mr. I. V. Williamson's deed of trust, by which he provides for the organization and support of the Williamson Free School of Mechanical Trades, is sounded in the clause: "I especially direct that each scholar shall be taught to speak the truth at all times, and I particularly direct and charge as an imperative duty upon the trustees that each and every scholar shall be thoroughly trained to habits of frugality, economy and industry, as above all others the one great lesson which I desire to have impressed upon every scholar and inmate of the school is that in this country every able-bodied healthy young man, who has learned a good mechanical trade and is truthful, honest, frugal, temperate and industrious, is certain to succeed in life and to become a useful and respected member of society."

That expresses the essential purpose of Mr. Williamson's great gift, which he tells us in the deed of trust he has contemplated for 30 years, and for which he has saved and accumulated the means during that long period. The Philadelphia *Ledger* sketches briefly the character of the Williamson Free School of Mechanical Trades for which provision has thus been made. The trustees, John Baird, James C. Brooks, Lemuel Coffin, Edward Longstreth, William C. Ludwig, Henry C. Townsend and John Wanamaker, are given full control of the details of organization and administration, subject only to the general provisions herein sketched. To found and support the school stocks have been set aside of the par value of \$1,500,000, estimated to be worth in the market about \$2,250,000. Of this amount one-fifth, or about \$450,000, will be available as a building fund for the purchase of land, erection of buildings and the furnishing thereof. This would leave for an endowment fund about \$1,800,000, the income of which is available for the expenses, support, maintenance, renewals and repairs of the school, its furniture, plant and equipment. A rough calculation, based on the cost of similar schools, shows that, without accretions to the fund now provided, this gift may be made to extend the benefits of free mechanical education and support to not less than 300 pupils, and perhaps to double that number.

The buildings are to be substantial structures of stone or brick, expensive materials and elaborate ornamentation being avoided, and they are to be erected on grounds in the suburbs of Philadelphia or in Bucks, Delaware or Montgomery county, not exceeding 300 acres in extent, but additional ground may be bought, after the school has been organized, provided the aggregate holding (exclusive of ground given, conveyed or devised) shall not exceed 500 acres, nor the average of cost \$400 per acre.

The institution is to be an absolutely free home and school for healthy young male persons of ages between 12 and 18 years, who must be bound as indentured apprentices to the trustees for such periods as the latter may determine, provided it shall not be for less than three years nor extend beyond the minority of the scholar. Preference is to be given to the poor. Other preferences (in the order named) are to those born in Philadelphia, in Bucks, Montgomery and Delaware counties, in other parts of Pennsylvania, New Jersey, in other parts of the United States.

The pupils are to be fed, clothed and lodged during the term of their apprenticeship; those who require it are to be given a good common school English education, and each is to be taught such mechanical trade as he may be fitted for; they may also be instructed in the art of farming or gardening or either. The pupils are to have moral and religious training, but no attempt is to be made at proselytism nor is favoritism to be shown to any particular sect or trade. Their physical training is also to be attended to, so that each one may grow up with a sound mind in a sound body. The trustees are given full authority to expel pupils who are intractable or insubordinate, or guilty of vice or crime, or to cancel the indentures of any scholar for any reason which they deem good and sufficient; and, finally, the trustees are authorized to give deserving pupils, when they leave the school at the end of their term of indenture, a sum of money not exceeding \$50 to any one scholar.

It will be seen from the above sketch of the nature of the school to be established that it will resemble Girard College in that it provides for the support as well as the education of its pupils, and that it will differ from the college in that it will be open to boys with parents as well as to orphans and half orphans, and more especially differs from Girard College in that all pupils must be taught a mechanical trade. The last mentioned is an essential difference, for though in recent years Girard College has introduced mechanical training, in obedience to Girard's direction to have the pupils taught "facts and things, rather than words or signs," yet trades are not taught, and, indeed, the plan of the school, as sketched by Girard, required that the pupils shall simply be prepared to learn a trade or business, and be bound out for that purpose. Mr. Williamson's scheme is based upon the advanced thought of the day that some trades may be effectively taught in a school in less time and more advantageously than they can be picked up by learners in a shop. That such an institution, supplementing the work of Girard College by taking deserving pupils excluded therefrom, may be made of great value to the community is evident, and Mr. Williamson has selected a Board of Trustees clearly alive to the purposes he has in view and fully capable of carrying them out with honor to themselves and to the founder of this great charity.

Pensacola, Fla., is building a marine railway on a novel plan, under the direction of French engineer. To secure permanency the columns supporting the ways will be made of wrought iron. The base of each column is to be provided or armed with a flange 16 inches in diameter. The superstructure will be made of four strings of double standard steel rails of 76 pounds to the yard, strongly bolted, riveted, cross-tied and braced together. The length under water will be 285 feet. The part above the water, and resting on a yellow pine trestle-work, is to be 250 feet long. The cradle or ship carriage is to be 225 feet long, and will be provided with cast-iron rollers, the bearings of which will be bolted to the lower part of the cradle. The motive-power will consist of a 40 horse-power 144 automatic cut-off steam engine, making 275 revolutions per minute. The gearing will be that of a worm and worm-wheel, driving a powerful wrecking capstan.

The Pratt Institute opens the first term of the year with about 1000 pupils. All the appointments of the buildings, the tools and implements of the shops and foundry, and the fittings of the different departments are of the best and creditable to the city.

The Iron Age

New York, Thursday, January 3, 1889.

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF, JR., - EDITOR.
GEO. W. COPE, - - - ASSOCIATE EDITOR, CHICAGO
RICHARD R. WILLIAMS, - - HARDWARE EDITOR.
JOHN S. KING, - - - BUSINESS MANAGER.

The Rail Trade in 1888.

The most prominent feature in the history of the iron trade during the past year has been the unsatisfactory condition of its greatest single industry, the manufacture of steel rails. Exceptionally prosperous in 1887, the rail makers have been notable sufferers from a decline in 1888. While the producers of other merchantable articles in the iron industry are dependent more upon the influences which shape the general prosperity of the country, the rail manufacturers are affected directly by rail road building and renewal. General consumption of iron and steel has been admittedly enormous during the past year, and has been reflected in a heavy volume of business done on a low level of prices. Railroad consumption has probably been below the normal quantity, considering the large mileage of the country.

The following table, showing the sales of steel rails, as compiled from month to month from the reports of the members of the association to its Board of Control, best reflects the wide differences there have been between the two years. On the 1st of February, 1887, there had been sold more steel rails for delivery in that year than had been entered for 1888 delivery on the 1st of December, 1888. All through 1887 it was the buyer who was endeavoring to place his orders. In 1888 there was an increasingly sharp struggle among the mills to secure work enough to keep going steadily.

Sales of Steel Rails, Gross Tons.

	1887.	1888.
To January 1.....	1,032,850	253,687
February 1.....	1,303,140	395,000
March 1.....	1,442,891	565,629
April 1.....	1,494,384	658,513
May 1.....	1,598,048	721,000
June 1.....	1,614,545	820,180
July 1.....	1,695,055	934,987
August 1.....	1,770,449	986,009
September 1.....	1,816,444	1,060,000
October 1.....	1,833,126	1,113,883
November 1.....	1,861,998	1,250,740
December 1.....	1,898,444	1,251,177

We may state in this connection that the reports of sales do not exactly record the time of the transaction, because in many cases business practically concluded but not formally settled by the signature of contracts is not reported until later. Still, the following table may prove of some interest as showing by monthly sales how the activity in the market fluctuated:

Monthly Sales of Rails, gross tons.

Months.	1887	1888	Delivery
Previous to January 1st.....	1,032,850	253,689	to December 1.
January.....	270,200	141,313	
February.....	130,751	170,629	
March.....	52,493	92,884	
April.....	103,664	62,487	
May.....	16,497	99,180	
June.....	80,510	114,807	
July.....	75,394	51,022	
August.....	45,995	73,691	
September.....	16,682	53,887	40,000
October.....	28,872	146,857	76,180
November.....	36,446	437	154,491
Total.....	1,898,444	1,251,177	270,671

The January report is, of course, not yet at hand, but from even a superficial knowledge of the business reported it may be stated that the sales for 1889 delivery to date are in advance of the aggregate of transactions closed for 1888 delivery at a corresponding period last year. This may or may not indicate heavier buying this year. On the whole, we are inclined to believe that it does. Thus far the bulk of the business done has been for renewals on old roads, and comparatively little for new construction. It is natural that for the former purpose the demand may be largely increased, because the cost of renewal is unprecedently low, owing to the fact that old iron rails are fetching within a few dollars a ton as much as new steel.

From a manufacturing point of view the following table showing the shipments of rails from the mills for each month for the years 1887 and 1888 is of considerable interest. In connection with it, as well as the other tables, it should be stated that the figures cover only heavy rails, light sections not being included in the reports:

Shipments of Steel Rails, Gross Tons.

	1887.	1888.
To February 1.....	1,042,226	29,861
March 1.....	235,160	98,361
April 1.....	389,532	184,580
May 1.....	564,403	249,556
June 1.....	747,181	448,149
July 1.....	907,351	585,558
August 1.....	1,045,048	710,502
September 1.....	1,219,717	824,000
October 1.....	1,390,825	921,363
November 1.....	1,569,033	1,029,179
December 1.....	1,729,108	1,116,788
January 1.....	1,833,649	

Official reports for the production of steel rails by all the mills, and of all weights, showed the total to have been 2,101,904 gross tons, or 268,255 tons more than the association shipments. For the first six months of 1888 Swank's production statistics gave a total of 692,197 gross tons, or 106,639 more than the shipments in the above table. This would indicate a total output of 1888 of between 1,350,000 and 1,400,000 gross tons. The capacity of the country is now between 2,400,000 and 2,500,000 gross tons, including the new mill.

So far as the outlook for the current year is concerned, there is nothing definite. It must depend very largely upon the railroad situation. The Eastern and Middle States and the Northwest are not expected to furnish much business as the result of new mileage. The principal demand is likely to come from the South, certain parts of the Southwest and the Pacific Slope. It would be idle to look forward to heavy buying because of low prices of rails. While it has its influence, experience has taught that railroad managers and speculators are not deterred from buying rails when they are high. The all-absorbing question with them is whether or not they can place bonds and market securities. Nor do low prices of rails notably stimulate construction, though they may influence renewal considerably.

A subject which has been attracting attention lately is the large capital of some of the Southern iron enterprises, be it in the form of stock or of bonds or both. In some cases heavy interest payments have caused anxiety to sell and have had some influence on the markets. We are far from considering this a subject for reproach, but the ownership of extensive tracts of

mineral lands has a natural tendency to lead to the building of additional furnaces. A few figures will illustrate this. Take, for instance, the case of a company whose property is represented stock and bonds to the extent of \$3,500,000, on which 6 per cent. dividends or interest must be earned. The company have mineral lands sufficiently developed to furnish the raw material for four modern furnaces, producing annually 150,000 tons of pig iron. This means the mining and coking of at least 300,000 tons of coal and, say, 375,000 tons of ore. Placing royalty, or its equivalent, allowance for exhaustion of lands at 5 cents a ton for coal and 10 cents a ton for ore—certainly modest figures—this would call for \$52,500 annually for a sinking fund. Add to it 6 per cent. on capital, including working capital, or \$210,000, reaching a total of \$262,500, equal to \$1.75 per ton on 150,000 tons of pig iron produced. How many Southern furnacemen make allowances for such fixed charges in their cost sheets?

The Duty on Lead in Silver Ore.

During the recent debate in the Senate on the Tariff bill a subject came up which has been widely discussed during the past year without apparently being well understood. Since our railroads penetrated into Mexico, and afforded transportation facilities to numerous mining districts, considerable quantities of Mexican ore have been shipped to American reduction works. The bulk of this ore has been entered as silver ore, in order to take advantage of a ruling of the Treasury Department some years since. The general practice has been that if an article contained or was composed of two or more substances the duty is dependent upon the rate of the component of greatest value. Silver ore is free; hence, under the ruling, ore carrying so much silver that the value of the precious metal is greater than that of any base metals it may contain comes in free. To illustrate: An ore carrying only 20 ounces of silver valued at, say, 90 cents an ounce, or \$18, could contain not less than 25 per cent. of lead, which, at 3½ cents, would be equal to \$17.50, and yet it would be pronounced a silver ore by the customs authorities.

The Senate Substitute bill contained the following item: "Lead ore and lead dross, 1½ cents per hundred, provided that lead ore containing silver ore, or silver ore containing lead, shall pay a duty of 1½ cents per pound."

The object of this proposed modification of the present law is to stop the evasion of a duty of 1½ cents a pound on every pound of lead contained in the alleged silver ore. This has become a matter of great magnitude. The only and latest official data we have on the subject are those given in the article on lead in the "Mineral Resources," published by the United States Geological Survey. It appears that during the fiscal year ending June 30, 1887, the lead contents of the silver ores imported amounted to 15,488 net tons of lead, valued apparently at 1 cent a pound. As the production of the metal was 160,700 tons in 1887, it is clear that not less than 10 per cent. of the whole product was derived from Mexican silver ore. Since then the quantity has very largely increased.

The smelters on the border pay 90 per cent. of the New York price for the silver and deduct about \$10 for smelting charges. They pay 1.75 cents per pound for the lead in the ore. The cost of smelting is probably not quite \$10, and the rate paid for the silver covers the loss in smelting, the allowance for loss in desilverizing and the express charges on the metal to market. The difference between the price paid for the lead at the smelter and the market price of 3.75 cents must cover the cost of desilverizing, the allowance for waste in that process, about 5 per cent., and the freights. It is clear that what advantage there is in the business accrues to the Mexican mine owners, because they receive the same rate of payment as the American ore producers. Practically, the amounts saved by evading the lead duty, through the importation of "silver ore," is made a gift to them. In other words, the mining districts of Northern Mexico are being stimulated at the expense of our own mines in the Rocky Mountains and in the Mississippi Valley.

Until the last few years only a very small quantity of lead has been produced in Mexico for shipment abroad, the bulk of what was made going to England as argentiferous base bullion. In some important districts the silver lead is simply cupelled, the baser metal being used only as a carrier in smelting. The country has not, generally speaking, the proper fuel at a sufficiently low price to become lead smelters of any consequence.

It is urged, in opposition to the demand for a suppression of the free lead imports in Mexican "silver ore," that it would ruin the two smelting works built during the past three years at El Paso, and that it would hurt a considerable number of other metallurgical establishments. So far as the El Paso works are concerned, they were built with the clear knowledge that, in reality, the whole lead imports were an evasion of the duty under the cover of a treasury ruling.

Independent Steam Engines.

It has for many years been the practice of manufacturers to consolidate their power as much as possible. Engine builders have been called upon to construct larger and larger engines, as much to meet the demand for a central source of power for the machinery of a large factory as for the requirements of very heavy special work which smaller engines were unable to perform. In this consolidation of power a large engine is located at a place adjacent to the boiler-room, and the power is thence transmitted or distributed by belts, shafts, pulleys, &c. Oftentimes power is thus transmitted over almost literally miles of shafting. It is carried from room to room, story to story, over or under alleys, and to out-of-the-way places requiring considerable engineering skill to apply the power where it is desired or to give the proper motion to the machinery. An inevitable waste of power occurs in operating any kind of machinery, but in the endeavor to run a whole factory of large size with a single engine fully as much power may be lost by friction or expended in driving heavy belts and long shafts as is utilized in the process of manufacturing.

From a mechanical engineer's standpoint,

the recent practice of a growing class of manufacturers is in some respects eminently superior to the system of consolidating power. A number of small engines are employed, being located in the various departments of the works where the power is to be used. Steam is conducted from the boilers, which are centrally placed, by well-protected pipes to the several engines. The loss by condensation in thus conveying steam any reasonable distance is not great, and the engine for each room or shop is set up in the most convenient place. The installation of such a power plant will not necessarily be more expensive than a large engine with its costly belting and shafting, but, on the contrary, it may for obvious reasons be less expensive, as with separate engines in each department the power needed can be more accurately gauged, thus avoiding the providing of a surplussage of power in the large engine which adds to its cost. Under special and frequently recurring circumstances there is a constant balance in favor of the independent engines from the time they start, as compared with the large central engine.

Aside from the question of economy there are other advantages brought forward by the advocates of independent power. The breaking down of an engine, a main shaft or a belt does not in this case stop the entire machinery of the works, but, on the contrary, each department, being independent of the others, can be operated without regard to breakdowns happening elsewhere. Even in cases where it might seem desirable, for some reasons, to locate the power in one place, this matter of breakdowns and consequent confusion throughout the entire establishment would seem to make the use of several small engines preferable. In the event of any one department working overtime, the entire steam plant and the entire shafting are not brought into use, but only the one engine necessary for that department, requiring less steam and consequently less fuel. Again, in establishments where more power is required at times than is usually the case, owing to the nature of the work in hand, the small engines are preferable, as an extra engine representing reserve power can be provided, but need not be run except just when heavy work is to be done. This is especially applicable to electric-light plants, in which by using the smaller engines the power required can be more readily adjusted to the needs of long and short time customers, city or commercial lights, domestic or manufacturing purposes, &c.

The increasing use of gas or oil for fuel assists the introduction of independent engines, since with such fuel the supply of steam is also made independent. The advantage of this in light manufacturing, or in departments in which power is used irregularly, or at times necessarily at variance with the usage of other departments, will readily be appreciated. The general convenience of oil firing, moreover, is another point worth considering. The development of the demand for engines to furnish independent power is causing quite a number of engine builders to pay special attention to this class of work. Their efforts are being directed to the construction of engines which will require a very small amount of care and attendance, and in this they are succeeding most admirably.

Mexico in 1888.

On December 1 last President Porfirio Diaz was inaugurated for a second term of four years. During his presidency Mexico has not only enjoyed the blessings of undisturbed peace, but had progressed rapidly in every respect. Spread over an area of 1,946,292 sq. km. the present population of the country is 11,000,000, 19 per cent. being whites, 38 per cent. Indians, and 43 per cent. mixed races. The population of leading cities is at present as follows: Mexico, 350,000; Puebla, 112,000; Guadalajara, 95,000; Leon, 60,000; Guanajuato, 52,000; Mérida, 40,000; San Luis Potosí, 35,000; Zacatecas, 30,000; Querétaro, 30,000; Oajaca, 28,000; Colima, 26,251; Saltillo, 26,000; Morelia, 25,000; Aguascalientes, 22,000; Vera Cruz, 21,000; Orizaba, 20,500; Pachuca, 20,200, and Durango, 20,000.

The foreign debt of Mexico amounts to \$28,800,000, and the home debt to \$100,000,000. The budget estimate of the Federal Government for 1888-89 fixes the income at \$37,900,000, and the outlay at \$38,537,239. The army has been kept in a good state of efficiency; it is 30,017 strong, commanded by 1950 officers. The navy consists of five gunboats. About 7500 km. of railway are in running order, and there are in operation 41,507 km. of telegraph, of which 21,453 are the property of the Federal Government, 6887 of States, 6143 of railroads, 4098 of private telegraph companies and 2926 Mexican cable. The Government has 339 offices in operation. There are 300 chief post offices and 724 minor ones, employing 1528 persons, the receipts being \$749,967 in 1887 and the expenses \$857,424. The post office dispatched last year 22,885,092 letters and postal cards through the home mails and 1,345,720 international letters. There entered Mexican ports in 1886-87 were 1240 seagoing vessels of a joint tonnage of 1,032,725, of which 653 were steamers, measuring 877,518 tons. The merchant marine of Mexico numbers 421 seagoing vessels and 847 coasting craft.

Mexican trade has fluctuated of late years as follows, reduced to thousands of dollars.

Fiscal year.	Import.		Export.	
	Merch'dise.	Merch'dise.	Silver.	Total.
1883-84..	\$34,025	\$13,252	\$33,473	\$40,725
1884-85..	35,839	14,515	32,157	46,672
1885-86..	38,715	13,741	29,906	43,647

Export in 1886-87.

	Merchandise.		Total.
	dise.	Silver.	
To the United States..	\$11,007	\$16,576	\$27,583
To England.....	2,397	11,122	13,519
To France.....	717	4,401	5,118
To Germany.....	891	1,290	2,181
To Spain.....	499	104	603
To other countries....	125	68	193

Totals..... \$15,636 \$33,561 \$49,197

The distribution of products exported was as follows:

Sisal hemp....	\$3,901	Istle fiber....	\$349
Coffee.....	2,627	Cattle.....	471
Hides and skins	2,211	Silver lead.....	323
Cabinet and dyewoods....	1,849	Other goods....	2,360
Tobacco.....	851	Silver.....	33,561
Vanilla.....	694	Total.....	\$49,197

The export of merchandise alone from January 1 to June 30, 1888, was \$10,169,485, showing an increase over the corresponding six months of 1887 of \$1,146,192 or 11 per cent., the United States receiv-

ing thereof 63 per cent., England 21 per cent., France 9, and Germany 5 per cent.

The American trade, merchandise only, exhibits the following figures:

Fiscal year.	Imports into the United States.	Domestic export to Mexico.
1888.....	\$17,329,889	\$9,242,188
1887.....	14,719,840	7,267,129
Increase.....	\$2,610,049	\$1,975,059

The parcel-post convention in a small way also stimulates commerce between Mexico and this country; out of the exchange of sample shipments by mail larger transactions frequently grow; everything, indeed, tends to increase our commercial intercourse with the neighboring republic since the railroad systems of the two countries are linked together, and that of Mexico uninterruptedly expands in all directions. The frequent mutual visits of merchants and others also contribute their share toward continually multiplying commercial and other relations, and in a couple of years Mexico will no doubt become the most important Spanish-American country we deal with, whether there be a reciprocity treaty or no.

Washington News.

(From Our Regular Correspondent.)

WASHINGTON, D. C., January 1, 1889.

Senator Allison and his colleagues of the sub-committee on their tariff substitute have lost no time during the holiday recess. They have held sessions daily, perfecting their bill by incorporating certain important amendments, so that every possible expedition might be thrown into the consideration of the measure in the Senate. There remain practically not more than 17 days till the 21st, the date fixed by common consent for taking a vote. Senator Allison says it will take every moment of that time to get the bill in a state of sufficient advancement to make the connection. To run over that date would reopen the whole subject unless the minority would agree to a few days extension if necessary. The Senator says that he will ask night sessions after a few days if that may seem necessary to the finishing up of the parliamentary part of the work in time.

The most important amendments which the sub-committee have been considering are the raising of the duty on tin plate from 1 to 2½ cents a pound, the classification of cotton ties as hoop iron and more clearly defining wire rods and wire for purposes of assessing duties. It is not improbable that Senator Brown, of Georgia, and possibly McPherson, of New Jersey, will vote for the Senate substitute. In the Republican ranks there is some opposition to sugar, especially on the part of Stanford, Ingalls, Plumb, Farwell and Cullom. Senator Allison, however, does not think that they will vote against the bill. In the House the fate of the Senate substitute for the Mills bill will be interesting. The chairman of Ways and Means and his party colleagues have been compiling data with a view to presenting a comparative exhibit of the operations of the two bills, Mr. Mills claiming that his bill is not practically hostile to American industries. The protection Democrats have been conferring as to their course. It is not improbable with the tobacco interests that the Senate bill will pass the House if brought to a vote. The Ways and Means party, however, with the co-operation of the Speaker, will not permit a vote until they shall have made a very careful canvass and satisfied themselves that they have the strength to defeat the Senate substitute.

THE STEEL CRUISERS.

The two steel cruisers contracted for on the Pacific are rapidly approaching completion. The Charleston will be ready for her sea trial about the middle of February, and the San Francisco will follow soon after. Mr. Scott, president of the Union Iron Works, of San Francisco, has been here and gives a very satisfactory account of the experience of his company in the construction of the two cruisers. He expects that this will be followed by the construction of the war vessels designed for the Pacific service. The steel plates for the vessels were contracted for in Pittsburgh. Mr. Scott says that the building of the two cruisers has given metallurgical industries, and particularly in steel, a great impetus, which he thinks will be permanent. To date about three-fourths of the steel used in the construction of 12 cruisers and armored cruisers for the United States on both coasts have been manufactured at Pittsburgh. The only exception, in fact, were the shapes turned out by the Phoenix Iron Company, at Phoenixville, and castings by the Standard Company, at Thurlow. The Pittsburgh establishments which have furnished this vast amount of steel for Government purposes are the Union Mills and Homestead Works of Carnegie, Phipps & Co., The Linden Steel Company, Oliver Bros. & Co., Park Brothers, Moorehead-McLean, and the Spang Company. The reports from the Bethlehem Company indicate that the plant for Government work is rapidly nearing completion.

CUSTOMS DECISIONS.

The following interpretation of the metal schedule in the statutes has been announced:

Certain automatic machines containing metallic clockwork, and which are used for the sale and distribution of chocolate, are dutiable as manufactures in part of metal.

Hooks and eyes coated with Japan varnish, and tinned and coated with lacquer, are not commercially known as japanned ware or as plated or gilt articles, and are dutiable as manufactures of metal.

Certain Odd Fellows' shields, 18 x 19 inches in dimensions, with various devices and lettering worked thereon in plush and metal, the groundwork being of the same materials, are held to be dutiable as manufactures in part of metal, and not as galloons, laces, &c., of gold, silver or other metal.

Certain steel clasps, with small steel chains attached for ornamentation, used in the manufacture of purses, are dutiable as manufactures of steel.

Reports as to the condition of winter wheat and the progress of seeding in California indicate better prospects than before at this season for the last three years. Reports from Washington Territory are of the same nature. Plowing and seeding has progressed uninterruptedly, and the area in wheat will be considerably increased over last season.

Boston is greatly exercised by an order from Secretary Endicott directing changes in the Charles River and Warren bridges to accommodate navigation, making necessary the expenditure of about \$2,500,000 to make the improvement. Congress assumed jurisdiction in this matter through the operation of the River and Harbor bill, regardless of harbor commissioners or other State authorities. It is claimed that in the interest of justice the question whether the existing structures are obstacles, and what extent of change is really needed, if any, for the convenience of navigation should be first fairly considered and determined by some adequate authority, giving the defendant city or corporation an opportunity to be heard.

THE METALS IN 1888.

Copper.

As from the very commencement of the year the French syndicate represented by M. Secrétan and the "Société des Métaux," of Paris, took the necessary steps to get control of the output of most of the leading Copper mines of the world, and succeeded in doing so for a number of years to come, the history of the Copper trade in 1888 on both sides of the Atlantic has been almost altogether that of the syndicate. Through the foresight and good management which marked those large and successful transactions the "Société des Métaux" established a well-earned reputation, and, much to the displeasure of consumers of Copper, the great—we may say unprecedented—monopoly stands at the close of 1888 stronger and more formidable than it did a year previous, in spite of the enormous load that has been fast accumulating on its shoulders. M. Secrétan, through his good management of this vast enterprise during the year, has indeed proved himself to be more of a "Grand Français" in 1888, than M. de Lesseps; the monster monopoly has become in the Copper trade the orb around which the proudest companies, the Calumet and Hecla, the Anaconda, the Tamarack, the Rio Tinto and others, have moved like satellites, and both in Europe and on this side people in the trade have stood fairly aghast at the magnitude and power of this big combination, with the annoying feature attaching to it that, hat in hand, the American consumer has to take the amount of domestic Copper apportioned him at a figure that may be called exorbitant considering the cost of production, and that a group of powerful capitalists from a distance dictates the price we have to pay for the product of our own mines. Humiliating as the reflection may be, the facts of the case are, however, more or less in keeping with those connected with other big monopolies that have grown up around us at home, being the outgrowth of the spirit of association in its latest, most unpleasant phases. Hence we have to get reconciled to such anomalies, of which the end is not yet to be foreseen. One of the most palpable results has been that the growth of a monopoly of the kind kills speculation on paper in the article monopolized. The lesson which the syndicate gave the bear cliques both in London and New York during the latter half of the past year evidently was not lost upon them, inasmuch as sales for a fall have since then become quite scarce; they would, of course, at once revive, and become more extensive than ever, from the moment the syndicate became seriously threatened or embarrassed in its position from some cause or other not to be foreseen at this writing. Meanwhile bear operations against the syndicate, on this side at least, have become pretty much extinct, depriving the Copper trade of one of its active features with which since the creation of the Metal Exchange we had become so familiar.

The year opened with Chili Bars on the spot in London at £85, and Lake at New York at 16¼¢. Both markets were irregular and weak in January, because the syndicate depressed prices; it was known later on that negotiations for control had meanwhile been set on foot with a number of leading companies in various quarters of the globe, our Lake region included, and London at one time was depressed to £73.15, closing at £78. 12/6, our own market declining to 15.90¢ and closing at 16.60¢. In February Copper continued dull and weak in our own market, going away from 16.60¢ to 16¢; London meanwhile first dropped from £77 to £74. 12/6,

but recovered under purchases made by the syndicate to £79. Smelters in England still declined purchasing furnace material. The Cape Copper Company declared a dividend of £2 7/8 share for the past three months, at the rate of 100 % per annum.

March developed no increase of activity among us, as, the price hardly varying at all from 16¢, the syndicate succeeded in selling the associated English smelters a considerable amount of furnace material, and at the same time secured the Namaqua (South Africa) Company's output for three years at £83. 15/-. London opened at £78. 17/8, and closed at £80.

Greater activity and strength developed in our own market in April, and Lake improved from 16¢ to 16.60¢. The closed shafts of the Calumet and Hecla Mine reopened on the 25th, the fire being extinguished. The Osceola Company, of Lake Superior, made a contract at 13¢ 7/8 lb with the syndicate for three years, dating from May 1, and half the profit over that figure. There was more doing in London, but no change, the quotation remaining £80. 5/. Toward the close of the month the syndicate threw overboard its holdings of Tin in London, thereby strengthening its hands as a Copper holder.

In May it was stated that the syndicate had made a contract with the leading Copper company in Japan; at the same time the terms transpired of contracts with other companies on the basis of £65 to the English companies, 13¢ 7/8 lb and half the profit in all over it, to the Lake companies; all for three years; and 11¢ to the Montana companies, the Anaconda only for the current year, production being stipulated to be curtailed in some of the American contracts. In addition to the contracts named, the syndicate held toward the close of May 45,000 tons of Chili Bars, supposed to average in cost £70. The syndicate made a pool sale to our manufacturers during the month of 10,000,000 lb Lake, spread over three months, at 16 1/2¢. Hardly anything to speak of transpired in our market besides this; opening at 16.65¢, it closed at 16.60¢, London opening at £80. 2/8, and closing at £80. 15/.

With the approach of midsummer the dealings in New York in June became trifling in extent; the little done consisted of purchases made by the syndicate, the month opening at 16.60¢, and closing at 16.55¢, the syndicate also buying some futures in London at £78. 7/8, while spot Bars opened at £80. 17/8, and closed at \$81. 2/8. The contract of the English smelters came to an end, as it was found not to work to mutual satisfaction; the syndicate then bought furnace material for its own account.

July was moderately active in this market, with a hardening tendency toward the close through covering by the shorts; opening at 16.65¢, the closing figure 16.75¢. London opened at £81. 2/8, dropped to £78. 6/8, and closed at £80. 17/8. The newly established standard alongside of Chili Bars, "good merchantable," advanced from £71. 5/ to £73. 15/. The syndicate bought furnace material freely. The Quebrada Company (Venezuela), producing 2606 tons fine in 1887, sold its estimated production for 1888, 1889 and 1890 to the syndicate; the Parrott Company, of Montana, made a similar contract for 16,500 tons of 2000 lb., all told, at 13¢, and 1/2¢ of any excess; the Boston Montana Company, 45,000 tons, for delivery over three years, at 12¢. Having been unable to make a contract with the Chili producers, the syndicate was compelled to pay them £77 to £81 as the Copper arrived, while obtaining, as shown above, the product of other producers at £53 @ £65.

In August and September the syndicate put the screws on and squeezed the Lon-

don and New York bears mercilessly, the price advancing in London from £80. 7/9 on August 1, to £105 on September 10; thence to recede to £91, and wind up September at £101. Lake Copper was driven in the meantime from 16.75¢ to 17.65¢, in order to close September at 17.60¢. Good merchantable brands improved from £73. 10/ to £78. 5/, the adoption of the latter being calculated to present a corner in Chili Bars, as above shown, in the future. To consumers the syndicate sold Chili Bars at £78 throughout the excitement. Meanwhile the notable advance in the discount rate in Europe rendered the holding of Copper over there more expensive. The Mason & Barry Company declared a dividend for the six months at the rate of 9 % per annum, equaling £24 7/8 ton profit on 7000 tons Fine annual production.

Operators for a fall in Copper all the way to January, 1889, had been so much scared on our Metal Exchange, and there was so little Lake Copper available outside of the amount controlled by the syndicate, that speculation received, so to say, a death blow on this side, and did not recover vitality for the rest of the year, *bona fide* consumers being supplied by the syndicate all along at about 1¢ below the nominal quotation on the exchange, the actual transactions at the latter dwindling to smaller and smaller proportions, and gradually becoming virtually extinct. In October the quotation on the exchange ranged from 17.60¢ down to 17.35¢, and in London receded from £101. 10/ to £78: while this was the case, the syndicate could not well shut its eyes to the fact that the visible supply of Copper in Europe and America increased steadily and in an alarming manner, that consequently either the selling price to consumers would have to be materially reduced so as to stimulate consumption or production curtailed. Not feeling disposed to reduce the price the syndicate in October and November made arrangements with Lake and other companies to reduce the output, and by way of compensation extend the contracts three or four times the original term. Many disinterested parties were at the time and are still of opinion that it would have been still better policy to reduce the figure at which the Copper is sold to consumers still further, and there was considerable disappointment at the non-adoption of such a course. But as the general public is not allowed to peep behind the curtain, and the cost of the Copper now under control of the syndicate may with commissions, interest, storage, freight in moving portions from England to France, &c., &c., be a great deal higher than is generally supposed, the syndicate cannot perhaps afford to reduce the present selling price to consumers to an extent that would be an inducement to consume the metal more freely, and again make use of it where other material has begun to take its place.

Under the circumstances, November was about as lifeless in the New York market as it possibly could be, while opening at 17.30¢ and closing at 17.40¢, London hardly varying from £78, at which it opened, closing at £77 10/. Meanwhile, various new Copper companies were being started in different countries, from Portugal to New Zealand, and some curiosity was expressed as to the coming Anaconda contract. In the meantime, the syndicate agreed with the Rio Tinto Company to prolong their contract till the year 1902.

December was ushered in with another fire in the Calumet and Hecla Mine, but it was deemed of minor importance and was got under control with great ease. The rumor received currency that the Calumet and Hecla and other companies had made the syndicate a proposal that the latter should pay them 14¢ in the future, without any share in the profits, instead of 13¢ and a share. This would simplify the accounting and at

the same time not keep the same pending so long, while the syndicate would be freer to sell the Copper at such rates as might appear expedient. It was added that there was some probability the syndicate would accede to this. Middle of December the visible supply of Copper in England and France was about 100,000 tons, while the syndicate held on this side 30,000 tons, constituting a total value at current prices of something like \$45,500,000. Early in December the syndicate made our manufacturers a pool sale of 20,000,000 lb of Copper, extending over three months, at 16 1/2¢. On our Metal Exchange hardly anything was done in the way of sales, the nominal range being 17.20¢ to 17.40¢, while London was steady at £77. 10/.

CORRESPONDENCE.

The St. Croix Range, Wisconsin.

To the Editor: About two years ago this country, known as the St. Croix Range, went through the agonies of a boom—not on iron, but on manganese ore. Reports of vast deposits of rich ore being found were circulated far and near; people went wild, as they generally do when anything savors of a boom. Mining companies to over 50 in number were formed, and every one was to become independently rich in an incredibly short period. However, in almost as short a time as it took to set the boom going, the enthusiasm dropped, and the St. Croix Range was declared a snare and a delusion. I must mention here that, with one or two exceptions, the parties who got up the boom and those who prospected the different companies' lands were lumbermen and farmers, totally ignorant of practical mining, and knew nothing whatever of ores. The excitement was merely created to promote stock-jobbing schemes.

Notwithstanding the chaos reigning and suspicion attached to mining on the St. Croix Range, there were two of us—Mr. J. A. Wilson and myself—who had faith in the range, not as a country containing large deposits of manganese, but one in which there is an extensive deposit of rich limonite iron ore, admirably adapted for foundry and car-wheel purposes. To satisfy ourselves that such was the case we commenced prospecting on one 40-acre tract, located within one mile of the town of Wilson and distant one-quarter mile from the Chicago and Northwestern Railroad, with the most satisfactory results. This property is now known as the Arthur mine. On about ten acres of this 40 alone, all we have as yet tested, we can show, by actual measurement, from 75,000 to 100,000 tons of ore, running as shown by the following analysis and letters from the furnace and foundry where the ore and iron were used:

ANALYSIS.

Silica.....	7.96
Alumina.....	1.33
Metallic iron.....	54.81
Metallic manganese.....	1.82
Sulphur.....	0.02
Phosphorus.....	0.13
Combined water.....	9.33

Analyst, Professor Dodge.

Metallic iron.....	55.50
Silica.....	9.30
Metallic manganese.....	1.67

Analyst, Doctor Lehnen.

Water.....	10.60
Silica.....	6.66
Aluminium.....	1.30
Iron.....	54.85
Manganese.....	1.21
Phosphorus.....	0.09
Lime.....	0.99
Magnesia.....	0.14
Sulphur.....	0.02

Analyst, Professor Hille.

BLACK RIVER FALLS, Wis., }
August 23th, 1888. }

J. A. Wilson, Esq.: DEAR SIR—We received three cars of "Arthur" mine ore August 21st, and have put the whole lot (147,580 pounds) through

the furnace, using 130,160 pounds alone, producing therefrom 64,315 pounds of pig iron, a yield of 49.4 per cent., using 114 bushels of charcoal per ton of pig iron (20 pounds of charcoal for a bushel). The rest of the ore was used in combination with Superior, one part of Arthur and three parts of Superior; total, both ores, 64,800 pounds, producing 37,230 pounds of pig iron, a yield of 57.34 per cent., on 91 bushels of charcoal per ton of iron. The first cast of iron, some 12 tons, showed considerable cold shortness, due probably to furnace conditions. The second cast of 16 tons was an average iron in strength, showing good color and quality. Both casts were No. 1 iron. We could use the Arthur ore, if selected, as this lot seemed to be, in mixture with Gogebic ores, whether to advantage as a matter of economy and cost further trial of ore and computation would only make known.

Yours truly,
H. E. BURT, Manager.

Since the above letter was written we made a further shipment of 540 tons of Arthur ore to Black River Falls, which has even given better satisfaction than the first lot, the furnace carrying 200 pounds more to the burden and making good No. 1 foundry on 85 to 90 bushels of charcoal. We have now a contract with the same furnace company (York Iron Company) for 5000 tons to be delivered at the rate of 40 tons per day. We are at present shipping 60 tons per day. The country is of a broken and rough nature, the ore coming to within 3 to 8 feet of the surface, admitting of its being stripped and the dirt got rid of in the cheapest possible manner, owing to the natural dumping grounds. The trend of the iron deposit is a little east of north and west of south, easily traced for several miles, and about 2 to 2½ miles in width.

Underlying the iron ore is a stratum of fairly rich manganese, which, by mixing with the iron ore, would give it the chilling qualities necessary for car-wheel purposes. In connection with the iron ore and manganese there are forests of the charcoal timber—maple, oak, &c.—besides being located within 50 miles of St. Paul and Minneapolis and within easy distance of other growing towns where foundries are in operation. The railroad facilities are good and rates reasonable. Practical men are becoming awake to the fact that, taking into consideration the large deposits of ore, the abundance of limestone and charcoal timber, the handy market and good railroad service, this is a good site for a blast furnace, so that before long I shall have the pleasure of informing you that contracts have been made for the erection of one. Yours truly,

P. A. GOUGH, Sup't Arthur Mine.
WILSON, ST. CROIX COUNTY, WIS., December 15, 1888.

An American in Korea who called on Minister Dinmore speaks of the condition of trade and the high favor which the king manifests toward citizens of the United States. In making contracts Americans are preferred, and it is suggested that the gold mines offer special attraction. At present gold is extracted by pulverizing the quartz under stone rollers. American cottons are in demand on account of their superiority. The foreign colony at Seoul is almost wholly American, and there is one large trading firm originally from Boston. The King's Royal School for the instruction of young Korean nobles is on the American plan under Professor Bunker. Seoul has a population of 300,000, but the trade is made up of what the Yankees would call a "whittling business."

Duluth, a rising city in the Northwest, during the past year has secured an independent direct railway line to the East, in addition to the advantages of deep water navigation and unsurpassed facilities for handling freights. Rates on goods from New York and Boston are as low as between those cities and Chicago, and Duluth's jobbing trade of late has grown rapidly.

TRADE REPORT.

Chicago.

Office of *The Iron Age*, 95 and 97 Washington street, CHICAGO, December 31, 1888.

The last week of the year has been characterized by general quietness, with consequently but slight variation in prices from those quoted in previous reports. Notwithstanding the dullness, a very cheerful view of the situation obtains in nearly every branch of trade, and the New Year is expected to bring with it a fair degree of prosperity. At present there is a remarkable dearth of disturbing elements to influence trade in general, while on the other hand enterprises are in progress or contemplated which ought to greatly increase the local consumption of Iron and Steel.

Pig Iron.—Representatives of furnaces in the Mahoning and Shenango Valleys are deeply interested in the advance of 50¢ per ton in freight rates to Chicago which goes into effect to-morrow. They will endeavor to put up the price of their Pig Iron to correspond, but it is questionable if the market will stand it. A similar advance in freight rates is expected from other points in Ohio. The manufacturers consider this action by the railroad companies unwarranted by the condition of trade, and will do all in their power to get rates reduced to the old standard. It is remarkable that this advance has been made by Northern railroad companies just at a time when the Southern railroads have made a reduction of 20¢ per ton on Pig Iron coming to the Northwest. Sales during the week have been quite limited, but inquiries are numerous, and are expected to lead to good business in January. Regular quotations are as follows for cash, f.o.b. Chicago: Lake Superior Charcoal, all numbers, \$19.50 @ \$20.50; Alabama Car-Wheel, \$26.25; Jackson County Softeners, No. 1, \$18.60; American Scotch (Blackband) No. 1, \$20 @ \$20.50; Hocking Valley Soft Foundry, No. 1, \$17.50 @ \$18.50; Lake Superior Coke, No. 1, \$17.50 @ \$18; No. 2, \$16.50 @ \$17; No. 3, \$15.50 @ \$16; Coke Bessemer, \$17.50; Southern Coke, No. 1 Foundry, \$17 @ \$17.25; No. 2 Foundry and No. 1 Soft, \$16.25 @ \$16.50; No. 3 Foundry and No. 2 Soft, \$15.50 @ \$15.75; Gray Forge, \$15; Mottled, \$14.25.

Bar Iron.—Considerable skirmishing for orders has taken place recently, and prices have receded slightly on Mill lots. Yet business is fairly active, and some large sales have been made. Common Bars are still quoted at 1.72¢ @ 1.75¢, half extras, f.o.b. Chicago, for Mill lots, and 1.90¢ @ 2¢ from store, but the advance in freight rates after January 1 will make the Mahoning Valley mills put their price to 1.75¢ @ 1.78¢, Chicago, and may also stiffen the views of others.

Structural Iron.—Orders for bridge material to the extent of 1500 tons were taken during the week, and some good Beam contracts for new buildings will shortly be placed. An advance of 2½¢ per 100 lb in freight rates from Pittsburgh is expected to stiffen weak spots recently developed. Quotations on Mill lots are as follows, f.o.b. Chicago: Angles, 2.15¢; Universal Plates, 2.20¢ @ 2.25¢; Tees, 2.55¢ @ 2.60¢; Beams and Channels, 3.40¢. Store prices are unchanged at 2.35¢ @ 2.50¢ for Angles; 2.60¢ @ 2.70¢ for Tees, and 3.80¢ for Beams.

Plates, Tubes, &c.—Nothing new has developed in this line, business having been quiet. Store prices are still as follows: Heavy Iron Sheets, Nos. 10 to 14, 2.60¢ @ 2.70¢; Steel Sheets, 3¢ @ 3.50¢; Tank Iron, 2.55¢ @ 2.65¢; Tank Steel, 2.75¢;

Shell Iron, 3¢; Shell Steel, 3.12½¢; Flange Iron, 4¢; Flange Steel, 3.50¢; Fire-Box Steel, 4.75¢ @ 5.75¢; Boiler Rivets, 4¢ @ 4.25¢; Ulster Iron, 3.75¢. Boiler Tubes, 60 ¢ and 82½ ¢ off.

Sheet Iron.—Mill lots of Black Sheets are quoted at 3¢ @ 3.02½¢, f.o.b. Chicago for No. 27. From store No. 24, sells at 3.10¢; Nos. 25 and 26 at 3.20¢ and No. 27 3.30¢. Small lots of Galvanized are unchanged at 60 ¢ and 5 ¢ off for Juniata, and 60 ¢ and 10 ¢ off for Charcoal. The demand has been checked for the time being, but stocks of the sizes and qualities most needed are still very low in all the warehouses.

Merchant Steel.—Some scattering sales of Spring and Machinery Steel are reported, but most houses have done very little business during the week. Quotations from stock are as follows: Bessemer Bars, 2.30¢; Tool Steel, 8.50¢ @ 9.50¢; Specials, 13¢ @ 25¢; Crucible Spring, 8.75¢; Open-Hearth Spring, 2.50¢; Open-Hearth Machinery, 2.40¢ @ 2.75¢; Crucible Sheet Steel, 7¢ @ 10¢.

Steel Rails.—No orders have been taken by local mills since our last report, but the inquiries in hand show that the railroad companies who have not yet closed for their year's requirements are being influenced by the recent stiffening of prices and will soon place orders for considerable quantities of Rails. The mills are firmly maintaining their quotation of \$30 and hope to be able to realize more in the near future.

Old Rails and Wheels.—A vigorous effort was made by some holders to sell their stocks of Old Iron Rails, for which they asked \$23, but they were unable to find any consumers within reach of this market willing to pay so much. A fair quotation is probably \$22.25 @ \$22.50. Renewed interest is manifested in Old Steel Rails, which can be sold at \$16 @ \$20, according to length, freedom from frogs, &c. Old Car-Wheels are being offered more freely, but the demand for them is light, \$19 being bid and \$19.50 asked.

Scrap.—Very light sales are reported. The continued mildness of the season has a tendency to keep stock plentiful and to weaken prices. An increased business is reported in New Axles, but it is not as yet sufficiently strong to affect the Scrap market. Quotations for carefully selected are as follows per ton of 2000 lb: No. 1 Railroad Wrought Scrap, \$20.50 @ \$21; No. 1 Wrought, from city dealers, \$21; Track Scrap, \$20.25 @ \$20.50; No. 1 Mill, \$14.50 @ \$15; No. 2 Mill, \$10; Horseshoes, \$20; Axles, \$26.50; Pipes and Tank, \$13; Cast Machinery, \$14 @ \$15; Stove Plate, \$11.50; Borings, \$10; Turnings, \$11; Axle Turnings, \$13; Mixed Steel, \$12.50; Coil, Leaf and Tire Steel, \$16. Mixed Country Scrap is worth \$15.

General Hardware.—The week has been pretty generally given up to stock-taking, making contracts with traveling salesmen for the coming year, reviewing the methods of the past and laying out the campaign for the future, and as far as possible getting matters in good shape to handle the business of 1889, which the jobbers of this city confidently expect will show a handsome increase over that of 1888. The only change in prices worthy of note is an advance in Sledges, which are now quoted to the ordinary trade at 70 ¢ off, instead 70 ¢ and 10 ¢ off.

Nails.—Wire Nails are now selling at \$2.50 from stock and \$2.45 in mixed carloads, the manufacturers' price being \$2.40 in large lots. Heavy purchases are being made at these reduced rates, but some manufacturers are refusing to book orders for delivery beyond January, in the

hope that prices can be advanced speedily. Steel Cut Nails are sold from stock at \$2 and in carload lots at \$1.95. When necessary to compete with manufacturers, these rates are shaded. The jobbers are still selling from stocks bought before the advance was made by the manufacturers, hence are able to compete with them. Manufacturers' prices are reported to be very firm at \$1.80, at mill.

Barb Wire.—Although some manufacturers have refused to sell for future delivery others have taken large orders and announce their capacity covered up to May. The price of Barb Wire is now a great deal firmer than it has been, but very low prices were made during the past month, Painted selling as low as 2.62¢, and Galvanized 3.25¢, which are believed to be the lowest prices ever accepted. Manufacturers' quotations for large lots are now 2.75¢ for Painted and 3.40¢ for Galvanized. Jobbers quote 2.90¢ for Painted and 3.60¢ for Galvanized in small lots, with the usual reduction for mixed carloads.

Pig Lead.—The week past has been very quiet, with 3.55¢ bid and 3.60¢ asked. Everett & Post have made a *résumé* of the year's business, from which we quote: "It is impossible to give an exact estimate of the production of Lead in the United States, but from what reports we have in we place it at 172,000 tons. The increased consumption may be accounted for by reason of large demand for underground cable work, water works, &c., and there is every reason to expect an increase of at least 10 % more in these several directions during the next year. Business at Chicago has been some 5000 tons in excess of any former year. The lowest price for the year was in December, and the highest in September. Monthly averages for the year in Chicago are as follows:

	Cents.		Cents.
January.....	4.875	July.....	3.85
February.....	4.80	August.....	4.30
March.....	4.80	September.....	4.875
April.....	4.45	October.....	4.55
May.....	4.15	November.....	3.525
June.....	3.85	December.....	3.50
Average for the year.....	4.30		
" " 1887.....	4.343		
" " 1886.....	4.50		
" " 1885.....	3.83		
" " 1884.....	3.58		

The North Chicago Rolling Mill Company have put one of their North Chicago furnaces in blast on Spiegeleisen with very satisfactory results. It has been in operation over three weeks and produces about 600 tons per week of 30 per cent. metal. The Ores used are from Batesville, Ark., and sufficient supply has been received to enable the furnace to run on this class of material through January. A small quantity of Spiegeleisen has been made heretofore in a few furnaces in the West, but merely as a matter of experiment. This is the first case, so far as our knowledge goes, of the manufacture of Spiegeleisen on a considerable scale in the Western States.

Philadelphia.

Office of The Iron Age, 220 South Fourth St., PHILADELPHIA, Pa., December 31, 1888.

Pig Iron.—The year 1888, although in many respects unsatisfactory to manufacturers, has been, on the whole, one of extraordinary development, and consumption, except for Rails, larger than at any time in the entire history of the country. The only really weak spot has been the Rail trade, but apart from that there is reason to believe that almost every consuming interest has been enlarged and strengthened to an unprecedented extent. Consequently the continuous large output of Pig metal has been absorbed without materially influencing prices, which at the close

of the year show a decline averaging about \$1 7/8 ton on Mill Irons, and \$2 on Foundry grades. The opening prices in January were \$20.50 @ \$21 for No. 1 Foundry and \$17 for Gray Forge, as against \$18 @ \$19 for No. 1, and \$18 for Gray Forge during the last week of December. The furnace output of Anthracite and Coke (omitting Charcoal) for the 12 months is estimated at about 5,970,496 tons, the weekly output on the first of each month having been as follows:

January 1.....	121,307	July 1.....	102,021
February 1.....	103,901	August 1.....	108,252
March 1.....	97,490	September 1.....	114,623
April 1.....	101,140	October 1.....	119,189
May 1.....	106,818	November 1.....	128,340
June 1.....	107,845	December 1.....	136,627

The fluctuations in prices were very light, considering the large amount of business that was done, the month of May having seen the lowest figures of the entire year. The Thomas Iron Company reduced their prices \$2 7/8 ton during that month, and still continue at the figures then announced—namely, \$16, \$17 and \$18, at tide, for the three grades. The weakest period was during the months of May, June and July. During August the demand showed signs of improvement, which become still more pronounced in September, and so continuing until about the middle of October, since which date the feeling has been less buoyant, prices gradually losing pretty nearly all that they gained. The record of the year, therefore, is not specially important, and has developed nothing calling for extended comment. The local market has not been interfered with very much by Southern Irons, although they are formidable competitors north and east, and to some extent at points within 100 or 150 miles south and west of Philadelphia. Western Irons are gradually working their way into the local foundries, and are now regarded as having a permanently established trade. Cornwall Red-Short Irons have monopolized an increasing amount of attention, and for awhile sold at the lowest figures on record—viz., \$14 7/8 ton, f.o.b. cars at furnace. Consumption of Cornwall Irons during 1888 is estimated to have been close on to 300,000 tons, with a steadily increasing demand. Prices are not quoted on these Irons at present, as they have a large amount of orders on their books, and are not in a position to accept outside business until some of these contracts are completed. Nominally quotations are \$16 at furnace, but no transactions of recent date have been reported. General consumption in and around Philadelphia is believed to keep pace with that at other points, which of course implies a very considerable growth. As regards the outlook during the coming year, the general idea is that consumption will be larger than ever. The Steel-Rail interest seems to be the only one that is in a doubtful position, and even that may soon feel the effects of the recent arrangement for avoiding disastrous competition among the railways. The general business of the country is in excellent condition. Locally, there probably was never a time in which the volume of business averaged larger than at present. Shipbuilding, locomotive, car and bridge building, engineering, machinery and all the diversified interests clustering around Philadelphia report an abundance of orders, so that there is every reason to expect a continued large consumption of Iron. The stove trade is the only one that seems to have been a little overdone, but even that, with a change to colder weather, may receive a new impulse and enable manufacturers and dealers to relieve themselves of somewhat inconvenient accumulations of stock. But taking the position as a whole, the feeling is very hopeful, and there is reason to believe that the volume of business will be in every respect equal

to, if not larger than, that of any previous year. Prices are not yet fully established, but are likely to be about the same as those ruling for some time past, viz.: \$16 at tide for Gray Forge, \$17 @ \$17.50 for No. 2 Foundry and \$18 @ \$19 for No. 1. The feeling is not so settled as could be desired, however, and much will depend on the demand during the next two or three weeks. If consumers take hold promptly, prices will soon become steady, but another month as dull and unsatisfactory as December has been would probably cause some parties to cut under, and so demoralize the entire market. There will be plenty of business before long. The question is, Can the enormous supply of Iron be taken without breaking prices?

Manufactured Iron.—Prices have kept very well in line with Pig Iron, the highest having been realized during January, and the lowest during May and June. The demand has been fairly uniform, and on the whole the year was tolerably satisfactory to manufacturers. Prices have been low, and the margin for profit small, but with full employment during the greater portion of the year, cost of production has been at a minimum, offsetting in some measure, the extremely low prices obtained for a large proportion of the product. One reason for the low prices has been the aggressive attitude of some of the large Steel companies. Steel Plates have been sold from Pittsburgh at much lower prices than local mills could accept, and business during the entire year has been more or less under the influence of quotations from that source. Consumption of Finished Iron was very large during the year, probably the largest on record. All departments have had a good run of business, and, so far as can be seen, the prospect for the coming year is equally favorable. There is no special run on any one department, but the demand is well distributed, car, locomotive, bridge and ship builders having plenty of orders, while the smaller industries are busier than they have been for some time. The Wrought-Iron Pipe mills have taken a great deal of material during the year, and expect to do equally well during 1889, as there is expected to be a heavy demand for Pipe. The capacity for production, however, has not only prevented any advance in prices on Finished Iron, but, on the contrary, has caused a shrinkage during the year, averaging about \$3 7/8 ton. In some extreme cases there may have been a difference from highest to lowest of probably \$5, but comparing the last week in December, 1887, with the last in 1888, the average decline will not be more than \$3 7/8 ton. Car builders have been the heaviest buyers of Bar Iron, and Wrought-Iron Pipe manufacturers have also taken a large amount of Skelp. The Plate mills have also been kept pretty fully employed, but it has been difficult to maintain prices because of Pittsburgh competition. The highest prices were during January—viz., Bars and Grooved Skelp, \$1.95, and Plates, \$2.15. During April and May prices began to droop, a decline of nearly two-tenths having been established before the middle of June. Prices continued weak during July, but in August symptoms of improvement developed, which during September resulted in an advance of about a tenth in Plates and Bars, and a tenth and a half in Skelp, which was fairly maintained until about the middle of October, when a drooping tendency again manifested itself. Since that date the feeling has been rather heavy, and while prices are nominally about a tenth above the lowest prices of the year there is too much reason for the belief that buyers will not come in unless liberal concessions are allowed on large orders. Meanwhile,

it's market, a waiting plenty of business to be done, but with some uncertainty in regard to prices, although they cannot under any circumstances be materially lower than they now are. Asking prices, 1.8¢ @ 1.9¢ for Bars, 1.85¢ @ 1.87½¢ for Skelp, and 2¢ @ 2.1¢ for both Plates and Angles.

Steel Rails.—The year just closed has been one of the most satisfactory ever experienced by Steel-Rail manufacturers. Prices opened in January at \$31.50, remained on that basis until June, when they reached \$30, remained at that figure during July, down to \$29 in August, \$28.50 in September, and to \$27.50 in November, with some transactions said to be at less than \$27. During December prices became firmer, with \$28 as a minimum, and so continue to this time. As an offset to the falling off in production, the demand for Steel in other forms has greatly increased, some of the mills disposing of from 25 to 30 % of their product in this way. The outlook for the incoming year is still uncertain, sales to date for 1889 delivery being less than 500,000 tons. Some of the works are closed for an indefinite period, and the chances do not appear to be very favorable for an early resumption, although if the railways settle their grievances things may improve sooner than at the moment seems probable.

Old Rails.—The scarcity of Old T Rails is shown by an examination of prices during the past 12 months. Commencing at \$22.75 in January and advancing to \$22 in February, they lost only 50¢ during March and April, partly regained it during May, selling down to \$21 during June, July and August, advancing steadily from that point to \$23 during September, and fluctuating between that figure and \$24 to the close of the year. Stocks are lighter than have been known for many years, and it is a remarkable coincidence that Old Iron Rails sell within \$4 or \$5 per ton of the price of New Steel Rails.

Mr. W. H. Blakey, formerly with W. H. Walbaum & Co., and Mr. Geo. D. McLellan, from the well-known house of James Watson, of Glasgow, have formed a partnership as Blakey & McLellan, and will do a general Iron business as agents for James Watson. The offices of the new firm will be in the Bullitt Building, Fourth below Walnut street.

Pittsburgh.

Office of *The Iron Age*, 77 Fourth Ave.,
PITTSBURGH, December 31, 1888.

In regard to the year just closed, there has probably never been in the history of Pittsburgh a larger volume of business, but owing to an active competition margins have been comparatively small, and there is a good deal of complaint in regard thereto, but in this respect Pittsburgh has been no exception. There have been very few failures among our manufacturers during the year just closed, and they were never perhaps in a more solid condition. As respects the new year, the outlook is generally regarded as encouraging; manufacturers expect that it will be fully equal to 1888, and they are hopeful that there will be an improvement in the matter of profit. Reports from the West and South, upon which Pittsburgh is dependent largely for a market for her manufactures, are generally of a favorable character, and these is no reason apparent at present why the expectations of our manufacturers should not be realized.

Pig Iron.—A break in the market just at the close of the year was not generally expected, but it has taken place; all grades of mill and foundry irons have gone off 25¢ to 50¢ per ton within the

past couple of weeks, and there is no assurance that they will not go lower. City furnacemen are held responsible for this decline; furnacemen in the Shenango and Mahoning valleys are generally well filled up, and so far as we can learn, they are refusing to meet the decline in this market. A valley furnaceman reports that nearly all the valley furnaces are sold ahead, that there is very little stock in first hands, and his view is that the cost of production is more likely to be increased than reduced, and that the action of furnacemen here, in making concessions in order to effect sales, was uncalled for. Quotations may fairly be given as follows:

Neutral Gray Forge.....	\$15.50 @	\$15.75, cash.
All Ore Mill.....	16.25 @	16.50, "
White and Mottled.....	14.50 @	15.00, "
No. 1 Foundry.....	17.50 @	17.75, "
No. 2 Foundry.....	16.75 @	17.00, "
No. 3 Foundry.....	16.00 @	16.25, "
No. 1 Charcoal Foundry.....	23.50 @	24.00, "
No. 2 Charcoal Foundry.....	21.50 @	22.00, "
Cold Blast Charcoal.....	25.00 @	28.00, "
Bessemer Iron.....	17.00 @	"

In regard to Bessemer, while it is offering freely at \$17, cash, there have been no sales that we can hear of reported below that price; there was a sale of 3000 tons reported for January, February and March at \$17, cash, and a broker has some 10,000 tons to sell in different lots, none of which is to be had under \$17, cash. But very few sales of Mill Iron reported during the past week, but good brands are to be had at \$15.50 @ \$15.75, cash, and there are but few buyers above \$15.50.

Muck Bar.—There is no improvement in the demand, and prices continue weak and drooping; we now quote at \$28.50, cash at which it is being offered, and this intimates that it might possibly be had at \$28, cash. A month or more ago it was difficult to obtain; now sellers greatly outnumber buyers.

Manganese.—Ferromanganese, 80 %, \$55 @ \$56 per ton, Spiegel, 20 %, \$28 @ \$28.50.

Manufactured Iron.—There are but few new orders coming forward just now, but an improved demand is looked for before the close of the month. Bars, \$1.80 @ \$1.85; Plates, \$2.20 @ \$2.25; No. 24 Sheet, \$2.85 @ 2.90; Skelp, \$1.70 to \$1.80 for Grooved and \$1.90 @ \$1.95 for Sheared. All 60 days, 2 % off for cash.

Nails.—There is no improvement in the Nail trade here, nor can be expected as long as buyers can do much better elsewhere. We continue to quote upon a basis of \$1.90 for 12d to 40d, 60 days, 2 % off for cash.

Wrought-Iron Pipe.—There is but little change in the situation. Business continues light as compared with what it was during the summer and fall, although all that can be expected at this particular time. It is worthy of mention that there is an increasing demand every winter apparently for Pipe; houses are being built, gas and oil well pipe lines being laid now, but of course nothing like there is during the summer. Prices continue irregular and are difficult to quote correctly. Discount on Black Butt-Welded Pipe in car lots, 52½ and 5 %; On Galvanized, do., 45 and 5 %; on Black Lap-Welded Pipe, 62½ and 5 %; on Galvanized, do., 52½ and 5 %; 2-inch Tubing, 13¢ per foot, net; 5½-inch Casing, 37½¢ per foot, net.

Old Rails.—We are advised of sales of some 4700 tons of American Tees, standard brands, at \$25 @ \$25.25, which may be regarded as the ruling prices. Sales Old Steel Rails at \$18.50 for short and \$20.50 for long lengths.

Billets, &c.—There is very little demand at present for Bessemer Steel Billets, and the market is easier. It may be quoted at \$28, cash. Nail Slabs, \$27.75 @ \$28; Domestic Bloom and Rail Ends, \$19 @ \$19.50, with but few offering, and until recently considerable inquiry.

Steel Rails.—Are still quoted in a regular way at \$28, cash, at mill. While Chicago has the advantage of cheaper transportation it is claimed that this is more than overcome here by labor, as it is said that wages are cheaper here than at Chicago.

Railway Track Supplies.—There has been no recent change in prices. Spikes \$2.10, 30 days; Splice Bars, \$1.80 @ \$1.85; Track Bolts, \$2.80 with Square and \$2.90 with Hexagon Nuts.

Old Material.—Demand continues light, but an improvement is expected before close of this month. No change in prices. No. 1 Wrought Scrap remains unchanged at \$21, net ton; Wrought Turnings, \$13 @ \$14; Car Axles, \$25 @ \$26; Cast Scrap, \$15.25 @ \$16, gross; Cast Borings, \$12 @ \$13; Old Wheels, \$19.50 @ \$20.

Cleveland.

CLEVELAND, December 31, 1888.

Iron Ore.—During the past week 20,600 tons of Ore were sent forward to furnaces, as against 14,600 tons for the same week last year. Furnaces in the Hocking Valley are filling out their Ore stocks, with a few all-rail shipments from Escanaba. The Ore is a non-Bessemer Hematite and costs the consumer not far from \$5.10 per ton delivered at the furnace. These shipments are explained by the fact that the buyers hesitated about increasing their Ore stocks until assured of sufficient orders to warrant such action. The demand came after the close of navigation and it became necessary to arrange for overland transportation. Many of the Ore companies will hold their annual meetings during the next two weeks and an approximate schedule of prices for 1889 will then be determined upon. Several furnacemen have already asked for quotations and active negotiations will begin within 12 or 15 days. Bessemer Ores are somewhat depressed because of the lack of activity in the Rail market.

Pig Iron.—Both buyers and sellers seem content to wait until after the holiday season before making any attempt to infuse life into the market. Nothing important in the way of sales has occurred during the week just closed. Furnacemen do not seem anxious to press their products upon the market, inasmuch as many of the furnaces are still running on old orders. The opinion that heavy orders for Mill and Foundry Iron will be placed in January seems universal. The Agricultural Implement interests will then make themselves felt and the tone of the market will, it is believed, be improved.

Manufactured Iron.—Although the mills are running on full time prices are becoming more favorable to buyers. Common Bar Iron has dropped to \$1.60 and Sheets are correspondingly depressed.

Old Rails.—Old American Rails are now selling at \$23.75 @ \$24. Turnings are selling for \$14 @ \$14.50.

Coke.—Although higher prices are expected, Coke can still be bought at \$1.25 per ton at the ovens. The market is active.

Cincinnati.

Office of *The Iron Age*, Fourth and Main Sts.,
CINCINNATI, December 31, 1888.

Pig Iron.—There has been but little change in the local market for Pig Iron during the week, but during the month a decided weakening has occurred, which has been manifested in a decline in prices. The prime cause for the reduction has been the increased production, and several furnaces have forced sales which have been used by buyers to magnify the tenderness of the market. The past week

has been devoted to the settlement of old scores rather than to the expansion of business, yet, while the volume of business has not been large and the majority of trades of small amounts, there have been one or two transactions of moment, one being the sale of over 10,000 tons Forge Iron for delivery during the first half of next year, at about \$14, cash, here. Prices of Forge and Foundry Iron, while exhibiting same easiness, are without quotable change.

Foundry.

Southern Coke, No. 1 (new classification)	\$16.25 @ \$16.75
Southern Coke, No. 2 (new classification)	15.50 @ 16.00
Southern Coke, No. 3 (new classification)	15.00 @ 15.25
Ohio Soft Stone Coal, No. 1	17.00 @ 17.50
Ohio Soft Stone Coal, No. 2	15.50 @ 16.00
Mahoning and Shenango Valley	18.00 @ 18.50
Hanging Rock Charcoal, No. 1	21.00 @ 22.50
Hanging Rock Charcoal, No. 2	19.00 @ 22.00
Tennessee and Alabama Charcoal, No. 1	18.50 @ 19.50
Tennessee and Alabama Charcoal, No. 2	17.50 @ 18.00

Forge.

Strong Neutral Coke	15.00 @ 15.25
Mottled Neutral Coke	14.00 @ 14.25
Gray Forge	14.50 @ 14.75

Car-Wheel and Malleable Irons.

Southern Car-Wheel	20.00 @ 25.00
Hanging Rock, Cold Blast	22.00 @ 25.00
Lake Superior Car-Wheel and Malleable	21.00 @ 22.00

Manufactured Iron.—There has been but little change in the temper of the market. Little effort has been made to effect sales and no disposition has been shown to make purchases of moment. Lower prices have been talked of in some quarters, but the general market has been steady.

Old Material.—The demand has been only moderate, but the offerings have not been pressing and prices have remained steady at \$19 @ \$19.50 per ton for Old Wheels and \$23 for Old Rails, cash, Cincinnati.

Nails.—There has been a quiet and easy market for round lots, and only a moderate demand for jobbing lots.

Chattanooga.

Office of *The Iron Age*, Carter and 9th Sts., CHATTANOOGA, December 31, 1888.

Pig Iron.—The demand has been about the same as before, and the shipments, perhaps, a little falling off in volume. Were it not for the large amount of orders that the furnaces have taken to be shipped soon after the beginning of the new year and during the first half of the year, the prospects might be called a little dull, but as it is, there are very few stacks but what are quite independent, especially for the first half of the year. We can hear of no sales at less figures than have ruled during the past two or three weeks, although there must have been some concessions, as a number of large round lots have been placed with some of the furnaces. The prospect is now that the new year will open with a very brisk demand, and a good trade for the entire year is anticipated from the fact that many large consumers, who have placed their orders, are now corresponding with a view of ascertaining prices for the coming year.

Louisville.

LOUISVILLE, KY., December 31, 1888.

Pig Iron.—There has been no change in the market, prices remaining the same as last week. Sales for immediate delivery have been few save for special grades of iron. There are a number of inquiries from parties desiring to make purchases running through 6 to 12 months. Their views, however, are very low, and most furnaces are not willing to meet them for such long deliveries, hoping that the first of the month will show a slight improve-

ment. One or two of the leading furnaces have already made sales running for such extended deliveries that buyers feel that the market can show no immediate improvement. It is hoped, however, that by the middle of January the present inquiries will result in sales whose tendency will be to help the market, as there is no reason why Iron should be selling so low at present. We quote as follows:

Southern Coke, No. 1 Foundry, new classification	\$15.50 @ \$16.00
Southern Coke, No. 2 Foundry, new classification	15.00 @ 15.50
Southern Coke, No. 3 Foundry, new classification	14.50 @ 15.00
Gray Forge	14.00 @ 14.50
White and Mottled, different grades	13.50 @ 14.00
Silver Gray, different grades	13.75 @ 14.50
Southern Charcoal, No. 1 Foundry	18.50 @ 17.00
No. 1 Mill	15.25 @ 15.75
Southern Car-Wheel, standard brands	22.50 @ 23.50
Southern Car-Wheel, other brands	18.50 @ 20.00
Hanging Rock Coke, No. 1 Foundry	16.00 @ 16.50
Hanging Rock Charcoal, No. 1 Foundry	20.00 @ 21.50
Hanging Rock, Cold Blast	21.25 @ 24.25

New York.

Office of *The Iron Age*, 66 and 68 Duane street, New York, January 2, 1889.

Foundry Pig.—The volume of business has naturally been very moderate, and no marked movement in either direction has taken place. On the whole, however, the tone is less confident than it was a month ago. We quote No. 1 Foundry, \$18 @ \$19, and No. 2 16.50 @ \$17.50.

Scotch Pig.—We quote: Coltness, \$20.50 @ \$21; Shotts, \$20.25 @ \$20.75; Langloan, \$20.25 @ \$20.50, and Dalmington, \$19.50 @ \$19.75.

Spiegeleisen.—We quote \$26.75 @ \$27 for 20 %, and \$54 for 80 % Ferro.

Plates.—We quote Iron Tank, 2¢ @ 2.2¢; Shell, 2.25¢ @ 2.4¢; Steel Tank and Ship Plate, 2.15¢ @ 2.25¢; Shell, 2.35¢ @ 2.5¢; Flange, 2.6¢ @ 2.75¢, and Fire-box, 3¼¢ @ 4¢.

Structural Iron.—We quote Sheared Plates, 2¢ @ 2.1¢; Universal Mill Plates, 2.1¢ @ 2.2¢; Angles, 2¢ @ 2.10¢; Tees, 2.5¢ @ 2.6¢, and Channels and Beams, 3.3¢ on dock for all sizes. Foreign Beams are quoted 2.55¢ @ 2.75¢.

Bar Iron.—We quote: Carload lots on dock, half extras, Common; 1.7¢ @ 1.75¢; Medium, 1.75¢ @ 1.8¢, and Refined, 1.8¢ @ 2¢.

Steel Rails.—Eastern mills have sold during the past week about 20,000 tons of Steel Rails, one block for Virginia delivery being a part of the business. Prices still continue somewhat uncertain, all of the sales noted above being at private terms. Reports from the West indicate a quiet week.

Old Rails.—No transactions are reported. Some buyers are in the market, but do not seem disposed to pay present prices, while holders are generally stiff. We quote Tees nominally, \$23.25 @ \$23.50, and Double Heads, \$24.

Spikes.—The market is dull, with Spikes at \$2.10 @ \$2.15 for large lots, delivered, and Angle Bars, 1.85¢ @ 1.9¢.

Financial.

The year 1889, it is agreed by common consent, opens auspiciously. No evil omens are discerned in the distance that excite apprehension, though ample field for statesmanship will open in settling the tariff question in its relations to the Treasury surplus, and the redundant issue of silver dollars will no less command attention. During the past few days holiday interruptions, the annual stock-taking, a temporary tightening of money market and other conditions inci-

dental to the closing season of the year tended to restrict business, but in all trade circles there is a confident tone, based on the conviction that a season of renewed activity is approaching. Stocks of merchandise have not accumulated to excess with rare exceptions, labor is well employed, and in nearly all branches of manufacturing there is a wholesome activity. The most noticeable factor just now is the apparent restoration of railroad freight tariffs to an equitable basis, with at least a reasonable promise of permanency. True, rivalries of agents, combinations among shippers and disagreements among speculative managers may bring a renewal of war, but restrictions are imposed under the new agreement that cannot well be disregarded. As regards the Interstate Commerce law, Senator Cullom says that if any legislation takes place in the direction of a repeal of the prohibition of railroad pools it must be by the next Congress, after a full investigation of the facts and circumstances.

The Stock Exchange markets were only moderately active. On Thursday apprehensions of tight money and a break in Cotton Oil Trust certificates were fully offset in their effects by the declaration of regular dividends on all the Vanderbilt properties, stockholders of Lake Shore receiving an extra 1 per cent., while New York Central promised to restore the 5 per cent. basis this year. Moreover, the T. C. C. & I. declared a dividend of 1½ per cent., the first since 1883. On Friday Lackawanna declared its regular dividend on the strength of a statement claimed to be the best in the history of the road. The Delaware and Hudson was credited with having earned 14 % in the year 1888, against 11½ % in 1887. On Monday the market was strong at the close, although money loaned during the last half hour at 10 %, the highest of the year. Reviewing the year, a comparative table of values shows that 40 active stocks have made important fluctuations. The average price of these 40 stocks on December 30, 1887, was 63½. The average price at the close of the market on Saturday last was 68½, showing that the general market is on a slightly higher basis than a year ago. Twenty of the 40 stocks were higher at the close of the year than at the opening, and one, Michigan Central, is unchanged.

The Western rate wars furnished the bears with a basis of operations throughout the year. The most important and favorable development was the success of the Reading bond deal abroad in June.

United States bonds were firm at the following quotations:

U. S. 4½s, 1891, registered	108½
U. S. 4½s, 1891, coupon	108½
U. S. 4s, 1897, registered	127½
U. S. 4s, 1897, coupon	128½
U. S. currency 6s, 1885	119

The total amount of bonds purchased to date under the circular of April 17th is \$101,705,500, of which \$51,396,650 were 4 % and 50,308,850 were 4½ %. The total cost of these bonds was \$120,244,090, of which \$66,010,877 was paid for the 4 % and \$54,233,213 for the 4½ %. The Treasury surplus on Saturday was stated at \$57,500,000. The recent scanty offerings of 4½ % on bonds attracted more attention, and the increased price named by the Treasurer, 108½, suggested the possibility of a change of policy. The amount of this class outstanding is estimated at \$183,000,000.

The weekly statement of the New York banks showed a decrease of \$1,095,000 in surplus reserve, which stands at \$6,281,350, against \$8,559,150 at the corresponding time last year, and \$12,271,350 in the first week of January, 1887, but this occasions no anxiety, as the local banks have large amounts available at interior points. In loans there was an expansion of \$1,297,000. Specie unexpectedly decreased \$1,246,000. In the money market

there was a marked easing of rates. Time funds continued quiet at about former quotations for two months, and $\frac{1}{2}$ % lower, at $\frac{1}{2}$ %, for 60 days to three months. Call loans ruled about 4 %. Commercial paper rates were a little easier. Money on call was active last week, on two occasions ranging 8 %, the highest of the year. Time loans were quoted $\frac{1}{2}$ @ 5 % for 30 @ 60 days; longer dates, 5 @ $\frac{1}{2}$ %. Commercial paper was in good demand, the supply limited. The disbursements of money in New York during the first week of the year on account of dividends and interest make an aggregate of \$65,000,000, promising easy money at an early date. Boston and Philadelphia each disbursed about \$10,000,000. Marketing the cotton crop weakened sterling, which is quoted \$4.85 $\frac{1}{2}$ @ \$4.89 $\frac{1}{2}$.

In the general markets most of the speculative commodities betray the same signs of weakness observable for some time past, but the closing days of the year brought more strength. In wheat there was more confidence, in prospect of better exports, and flour for export was ordered more freely at higher prices. The turn of the year was awaited with some interest. The grocery trade was pronounced to be in a decidedly favorable position. According to the Custom House report, the exports of specie were \$691,000, making a total since January 1 of \$46,208,804, against \$18,501,346 for the same time in 1887. The imports of specie were \$164,000, and since January 1 \$7,469,901, as compared with \$40,077,124 for 1887.

Spot cotton was fairly active at former quotations. Trade in dry goods was light.

The Committee of East-bound Freight Traffic decided that on January 10 the rates on articles of iron and steel manufacture, under head of special iron articles, should take fifth-class rates in carloads and sixth class in less than carloads, and scrap iron should also be governed by this rule.

The forthcoming report of the New York Chamber of Commerce for the fiscal year presents some interesting statistics relating to the foreign commerce of New York, as compared with the aggregate of all other ports of the United States. Total value of imports 1887-88: Port of New York, \$510,268,432; aggregate of all other ports, \$273,026,668. Total exports of domestic merchandise: Port of New York, \$325,789,244; aggregate of all other ports, \$391,268,364. Excess of foreign imports over domestic exports at the port of New York, \$184,498,188; same for all ports of the United States, New York included, \$66,237,492. A comparison of the commerce of the years 1887-88 and 1886-87 shows an increase at the port of New York of \$19,717,963; for all ports in the United States, \$20,992,328. Last year's foreign commerce for the port of New York exceeds that of any year since 1881 and for the whole country since the same year.

The number of mercantile failures in the United States during the year 1888 aggregated 10,587, which is 847 more than for 1887. The number in New York City was 529, against 432 in 1887. The clearings of 40 cities for the week ended December 29 showed an increase of 19.6 % compared with last year. Outside of New York the increase is 9.6 %. New York increased 25.4; Boston, 22.1; Philadelphia, 13.1; St. Louis, 35.7; New Orleans, 6.7; Baltimore, 0.4; Pittsburgh, 19.8; St. Paul, 26; Minneapolis, 27.2; Denver, 35.4. Chicago decreased 10.9.

The Niagara River Iron Company's extensive plant, at Ironton, on the Niagara River, below Tonawanda, which has been standing idle for the past 11 years is now about to be revived. The works have been leased by the bondholders, to parties interested in iron manufacture in Western Ohio.

The lessees will put the plant in order, and "blow in" as soon as possible for the manufacture of pig iron. They will probably employ a large number of men. The property represents an investment of over \$400,000.

Coal Market.

The Anthracite Coal trade is dull and uneventful. The chief anxiety among producers is to prevent undue accumulation and uphold prices. Meetings of Coal trade managers, held during the last days of the old year, had no practical result, further than a mutual understanding respecting the necessity of adhering to the policy pursued of late in regard to maintaining the relations of supply and demand. No changes were made. The statistics of production during the week ended December 22 show a falling off of 25 %, compared with the corresponding week in November, the total from all the mines being 618,534, which is about 60,000 less than for the previous week and 75,000 below that of the same week in 1887. Since January 1, 1888, the aggregate is 37,636,479, against 34,287,379 for the same time in 1887, an increase of about 3,350,000 tons. Quotations are: Hard White Ash, Lump, \$4.50; Broken, \$4.15; Egg, \$4.40; Stove, \$4.65; Chestnut, \$4.55; Free-Burning, f.o.b., Broken, \$3.95; Egg, \$4.30; Stove and Chestnut, \$4.65; Pea, \$2.75.

Bituminous Coal is more quiet—pool quotations, \$3.25, f.o.b. Cumberland shipped 68,700 tons; Clearfield, 60,800; Beech Creek, 40,000 tons. The Berwind-White Mining Company are supposed to be the largest "individual" producer of Coal in the United States. They are supposed to have mined and shipped during 1888 2,500,000 tons of Coal. Referring to the suit brought against the Pennsylvania Railroad Company by R. B. Wigton & Sons, for alleged discrimination, the Pittsburgh *Despatch* says: "Whether the Wigtons can prove to the satisfaction of Judge Allison's bench that their growing neighbor has been getting rebates of from 25¢ to 50¢ per ton is a problem with Coal men. If the Berwind company have been getting the rebates claimed, it means that Coal mined under the auspices of the pool is shipped at a \$2.25 or \$2.30 rate."

Contracts for supplying Philadelphia with Gas Coal during the year 1889 were awarded last week. The following were the successful bidders:

	Tons.	Price per ton.
Manor Gas Coal Co.	5,000	\$3.81
Penn Gas Coal Co.	57,720	3.82
Westmorland Coal Co.	57,720	3.82
Newburgh Orrel Coal and Coke Co.	15,000	3.76
James Boyce	15,000	3.76
Despard Coal Co.	10,000	3.76
J. & W. Wood	10,000	3.76
Chesapeake & Ohio (C. B. Orcott)	25,000	3.80

Total..... 195,440

The amount called for was 210,000 tons. The prices paid for 1888 were \$3.79, \$3.83 and \$3.84.

The Wheeling, Lake Erie and Pittsburgh Coal Company has been organized, with James M. Hain as president. Capital, \$1,000,000 in bonds and \$1,000,000 in stock. This company has bought all the valuable Coal lands along the Wheeling and Lake Erie extension, and will proceed at once to open the mines.

The Reading has begun construction of a three-mile link between its road and the Lehigh Valley tracks at Silverbrook, Pa. The branch will open up a new Coal field heretofore monopolized by Lehigh Valley.

At a meeting of the Coke workers of the Connellsville district on Saturday, it was decided to demand an advance of $\frac{1}{2}$ % at once. The advance is based on \$1.35 per ton for coke, which is 10¢ above the present selling price.

Imports.

The imports of Iron and Steel, Hardware, &c., at this port from December 21 to December 27, inclusive, and from January 1 to December 27, inclusive, were as follows:

	Dec. 21. to Dec. 27.		Jan. 1 to Dec. 27.	
	Tons.	Tons.	Tons.	Tons.
Pig Iron: G. W. Stetson & Co.	200	15,050		
Crocker Brothers	140	15,724		
Spiegel Eisen: Naylor & Co.	600	12,632		
J. A. Jansen	413	12,485		
Crocker Bros.	141	12,724		
Steel: Thos. Prosser & Son	31	306		
Pierson & Co.	22	150		
W. F. Wagner	6	1,518		
F. S. Pilditch	5	525 $\frac{1}{2}$		
Chas. Hugill	5	315 $\frac{1}{2}$		
Knauth, Nachod & Kuhne	3	3		
Steel Rods: H. H. Wolff & Co.	51	4,237		
Steel Sheets: Lalance & G. Mfg. Company	12	538		
R. Crooks & Co.	9	375		
Steel Plates: Williams & W.	10	10		
Steel Hoops: A. R. Whitney & Co.	429	2,819		
Ogden & Wallace	10	44		
Iron: Thos. Prosser & Son	9	10		
E. G. Jacobus	4	53		
Rivet Rods: A. Milne & Co.	51	361		
Old Iron Rails: C. L. Perkins	101	101		
Iron Wheels: R. F. Downing & Co.	9	65		

Tin Plates.

	Boxes.	Boxes.
Phelps, Dodge & Co.	16,781	572,383
Pratt Mfg. Co.	14,301	175,095
A. A. Thomsen & Co.	6,444	170,671
Dickerson, Van Dusen & Co.	3,897	285,309
T. B. Coddington & Co.	3,207	178,296
Bruce & Cook	2,938	106,402
G. B. Morewood & Co.	2,822	51,584
N. L. Cort & Co.	1,052	116,447
H. R. DeMilt & Co.	847	18,694
R. Crooks & Co.	412	67,642
Merchant & Co.	272	25,358
Hy. Whittemore & Co.	211	47,627
Central Stamping Company	210	38,435

Metals.

	Pounds.	Pounds.
Tin: Phelps, Dodge & Co.	336,257	4,086,082
Bidwell & French	112,235	679,962
Naylor & Co.	112,068	3,831,690
F. Naumann	2,240	5,240
Lead: Hendricks Bros.	21,036	65,888

Hardware, Machinery, &c.

Boker, Hermann & Co., Mdse., cs., 23; Iron Chains, cks., 17
 Clark, G. A. & Bros., Mach'y, cs., 6
 Field, Alfred & Co., Mdse., cs., 20; Hdw., pkgs., 55; Anvils, 115
 Foley, Edward, Mach'y, pkgs., 21
 Graef Cutlery Co., Cutlery, cs., 19
 Hartley & Graham, Mach'y, csc., 1
 Marshall & Co., Mach'y, cs., 3
 Morse Machine Company, Mdse., cs., 2
 Sacks & Richmond, Nails, cks., 12
 Sheldon, G. W. & Co., Mach'y, pkgs., 34
 Wiebusch & Hilger, Lim., Mdse., 15; Anvils, 208; Hdw., cs., 8
 Order: Mach'y, cs., 5; ditto, pkgs., 489; Steel Bands, Rollers and Forgings, 120

Exports of Metals.

	Dec. 21. to Dec. 27.		Jan. 1 to Dec. 27.	
	Pounds.	Pounds.	Pounds.	Pounds.
Copper: J. Abbott & Co.	13,252,107			
Lewisohn Bros.	4,041,522			
F. A. Lomal	2,561,253			
American Metal Company	6,578,006			
G. H. Nichols	223,939			
J. Bruce Ismay	112,000			
S. Mendel	500,000			
Ledoux & Co.	110,276			
Muller, Schall & Co.	430,000			
Copper Queen Con. M. Company	224,084			
J. Kennedy, Tod & Co.	112,026			
H. Becker & Co.	1,250			
Orford C. & S. Rfg. Company	112,000	561,881		
Robt. M. Thompson		125,000		
Thos. J. Pope, Sons & Co.		1,451,130		
Williams & Terhune		99,320		
J. Parsons & Co.		420,000		
Naylor & Co.		448,809		
Jas. E. Pope, Jr.		167,500		
Bridgeport Copper Company		112,000		
C. Herold		250,000		
Phelps Bros.		6,250		
Burgess & Co.		51,840		
R. W. Jones		169,984		
Ladenburg, Thalmann & Co.		229,371		
W. H. Crossman & Bro.		4,000		
R. Crooks & Co.		1,009		
Copper Matte: Williams & Terhune		38,339,036		
Lewisohn Bros.		3,021,610		
American Metal Company		5,089,180		
J. Abbott & Co.	239,709	682,962		
C. Ledoux & Co.		939,909		
F. W. J. Hurst		184,388		
G. H. Nichols		722,777		
H. T. Nichols & Co.		180,995		
Kunhardt & Co.		41,652		

Metal Market.

Copper.—London to-day sends futures of Chili Bars and G. M. B. unaltered, £78, and Best Selected lower, £80. In our own market nothing to speak of occurred, and the quotation for Lake on the spot remains nominally 17½¢. From January 1 to December 18 the import of American Copper into Liverpool and Swansea was 23,677 tons Fine, against 15,561 tons the same time in 1887. The visible supply in England and France on January 1, 1889 was 104,035 tons, against 97,940 on December 1, 1888. The Chili charters in December were 2900 tons, against 3400 tons in November; the total supply for England and France during December was 11,400 tons, against 9750 in November, of which American, respectively, 2600 and 1900, and the deliveries in England and France in December were 5200 tons, against 5850 in November.

Tin.—On Thursday of last week the London quotation was £98. 5/ for spot Straits; on the 31st ult. it was £100. 2/6, and this morning it is £99. Futures had improved from £99. 5/ to £101, and they are now £99. 15/. In our own market a sale was made last week of 10 tons, prompt shipment, at 22.20¢, and of 10 tons, ditto, at 22.25¢, closing on Saturday at 22.05¢, spot, and 22½¢ March. Since then the nominal spot quotation is 22¢, the market closing dull and weak. **Tin Plates.**—We have again had a very quiet week, limited to a small jobbing demand for immediate wants. The business in futures has also been very light, owing to the firm position assumed by makers, who say that at the present prices of Steel Bars and Pig Tin they cannot afford to come down to buyers' views. One or the other must, however, give way soon, as the business will have to be put under way to meet spring requirements. Liverpool cables 13/ @ 13/3 for Cokes. We quote, large lines, 3/ box: Siemens-Martin Steel, Charcoal Finish, \$4.75 @ \$5.50; Coke Finish, \$4.65 @ \$4.70; Terns \$4.12½ @ \$4.25; Coke Tins, \$4.22½ @ \$4.30, and Wasters, \$4.12½ @ \$4.15.

Lead.—Some 400 tons Common Domestic were sold since our last report in the open market at 3.85¢, which is also the closing quotation; the market winds up quiet, but strong. At St. Louis and Chicago the quotation is 3.55¢ to 3.90¢. London stood £12. 17/ 6 with soft Spanish on the 31st ult. and is down now to £12. 15/, English Pig declining from £13. 2/6 to £13.

Spelter.—Absolutely nothing has transpired during the week under review; we quote Domestic, common brands, 5¢, and Silesian 5½¢, both nominally. In London Silesian wound up at £18. 2/6 on December 31; to-day there is a recovery to £18. 5/.

Antimony.—Remains firm at 13¢ Cookson and 11¢ Hallett, the latter being unaltered, £45, in London.

New York Metal Exchange.

The following sales are reported:

THURSDAY, December 27.	
100 tons Lead, May.....	3.95¢
FRIDAY, December 28.	
10 tons Tin, prompt shipment.....	22.20¢
10 tons Tin, prompt shipment.....	22.25¢
16 tons Lead, January.....	3.90¢
100 tons Lead, March.....	3.90¢
16 tons Lead, June.....	3.95¢
MONDAY, December 31.	
10 tons Tin, January.....	22.20¢
30 tons Lead, spot.....	3.90¢
30,000 lbs. Lake Copper, March.....	17.40¢
WEDNESDAY, January 2	
10 tons Tin, spot.....	22.00¢
10 tons Tin, February.....	22.15¢

British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]
LONDON, WEDNESDAY, Jan. 2, 1889.

A better feeling has developed in all branches of the Pig Iron market. Preliminary data from the annual reports of production, consumption, &c., make a favorable exhibit, and deliveries latterly to home consumers also impart some degree of encouragement. Most brands of Scotch Pig have undergone some advance, as have also Middlesboro' Pig and Hematites, the latter being again in brisk demand. Speculation in warrants has shown more animation, the good demand for makers' brands doubtless offsetting, in a measure, the large stock in public stores. Five furnaces have been banked down during the week, for various causes, but there is some movement now in the other direction. In the latter connection it is to be reported that the Glengarnock works are preparing to resume.

There have been no important developments in the Manufactured Iron branch. The general demand is good and prices are firm, with 2/6 advance quoted on Black Sheets. In the Steel trade business continues brisk. Liberal orders are being placed for shipbuilding and railway descriptions and for Billets, while an improved demand is noted for Wire Rods and Crop Ends. The Cockerill Company has booked an order for 3700 tons light Steel Rails for a Roumanian railroad at 154/, and another company has secured one for 24,000 tons for Melbourne. The Wigan Company is laying down a steel plant for the manufacture of Blooms.

Tin Plate makers report a good many inquiries since the Christmas holidays. The volume of business accomplished has been moderate, however, owing, doubtless, to a wide difference between buyers and sellers on prices.

No change is apparent in the demand for Copper. Consumers purchase in the same conservative manner as for some time past; outside speculation is light and the "syndicate" agents have not figured conspicuously in any movement. It is stated that the European holdings of the "syndicate" amount now to fully 110,000 tons. A new scheme is said to be under way involving the creation of an English company, with a capital of £3,000,000. The purpose of this company, according to current report, is the purchase of 80,000 tons of the French syndicate supply and the renewal of contracts with producers for their output for a series of years. Whether this is one of the periodical imaginary projects that come to the surface, or something of a more substantial character, is not clear at this time.

Block Tin has ruled stronger under the stimulus of higher price in the East and livelier speculation. The demand for Lead and Spelter has been more active.

Scotch Pig.—There has been a very fair business and the market is firm, with prices a shade higher on most brands.

No. 1 Coltness, f.o.b. Glasgow.....	51/
No. 1 Summerlee, " ".....	50/8
No. 1 Gartsherrie, " ".....	49/
No. 1 Langloan, " ".....	50/
No. 1 Carnbroe, " ".....	45/
No. 1 Shotts, " at Leith.....	50/
No. 1 Glengarnock, " Ardrossan.....	48/
No. 1 Dalmellington, " ".....	43/6
No. 1 Eglinton, " ".....	42/6

Steamer freights, Glasgow to New York, 4/, Liverpool to New York, 10/.

Cleveland Pig.—With a better general demand the market has shown greater firmness. No. 1 Middlesboro', G. M. B., 36/; No. 3 do., 33/9.

Bessemer Pig.—The market is quite strong and fairly active. West Coast brands, mixed numbers, 45/, f.o.b. shipping point.

Spiegeleisen.—Prices remain firm and the demand is fairly active. English 20 % quoted 80/, f.o.b. N. W. England shipping point.

Steel Rails.—Business has continued brisk and prices remain very firm. English sections quoted at £3. 19/6 @ £4, and light sections £4. 2/6 @ £4. 10/, f.o.b. at N. W. England shipping point.

Steel Blooms.—A moderate trade in these at previous prices. We quote £3. 18/6 for 7 x 7, f.o.b. at N. W. England shipping point.

Steel Billets.—There continues to be a good trade at firm prices. Bessemer, 2½ x 2½ inch, £4. 2/6, f.o.b. at N. W. England shipping point.

Steel Slabs.—Demand only fair and prices without important variation. Bessemer, £3. 18/6, f.o.b. at N. W. England shipping point.

Old Rails.—There is no change in the character of the demand, and prices show slight change. Tees quoted at £3. 5/ @ £3. 6/, and Double Heads, £3. 8/ @ £3. 10, c.i.f. New York.

Scrap Iron.—The market has remained quiet, with prices steady. Heavy Wrought quoted at £2. 2/6 @ £2. 5/, f.o.b.

Crop Ends.—A livelier market reported, with prices firm, but no higher. Bessemer quoted £2. 7/6 @ £2. 10/, f.o.b.

Tin Plate.—Makers firm at last week's prices, and the demand fairly active. We quote, f.o.b. Liverpool:

IC Charcoal, Allaway grade.....	15/3 @ 15/6
IC Bessemer steel, Coke finish.....	1/6 @ 13/9
IC Siemens " ".....	13/9 @ 14/
IC Coke, B. V. grade.....	13/3 @ 13/6
Charcoal Terne, Dean grade.....	12/3 @ 12/6

Manufactured Iron.—Prices very firm all through, and business satisfactory in volume. We quote, f.o.b. Liverpool:

	£	s.	d.	£	s.	d.	
Staff. Ord. Marked Bars.	@	8	2	6			
Common " ".....	@	5	12	6			
Staff. Bl'k Sheet, singles.....	@	7	12	6			
Welsh Bars (f.o.b. Wales).....	5	0	0	@	5	2	6

Tin.—The market has been more active and stronger, with £3 advance scored during the week. Straits quoted to-day at £98. 15/, spot, and £99. 10/ for three months' futures.

Copper.—No material change in the character of business, and only slight variation in prices. Chili Bars, £77. 5/, spot, and £78, three months' futures. Best Selected, £84.

Lead.—More business doing, but very little change in prices. To-day's quotation, £12. 15/ for Soft Spanish.

Spelter.—A good trade and prices very steady at £18. 2/6 @ £18. 5/ for ordinary Silesian.

A manufacturing firm in New York has sent to the Department of Agriculture specimens of a new fiber they are making from the stalk of the cotton plant. The samples received strongly resemble hemp, and seem to be adapted to all the uses that hemp is put to. A few fibers of it twisted together in the hand show remarkable tensile strength, although no exact comparative tests with other fibers have yet been made.

Hardware.

After a year which is generally regarded as prosperous and satisfactory, 1889 opens with a market steady and even in most lines and a condition of things generally which is thought to promise well for future business. Prices in most lines are low, and in some lower than they have ever been, so that manufacturers are disposed to complain of their narrow margins of profit. It is, however, hoped by many that in some lines there will be an improvement in price, and that at any rate in the present condition of business through the country and the increasing export demand for American Hardware, there will be a satisfactory trade.

Cut Nails.

The situation has not undergone any material change except that an increasing number of Eastern manufacturers are discouraged by the long-continued depression, and show a growing indifference as sellers. The output is therefore being curtailed more and more through natural causes. It is estimated that the Cut Nail mills east of the Allegheny Mountains made about 2,250,000 kegs of Cut Nails in 1888 against 2,727,734 kegs in 1887. We continue to quote carload lots on dock \$1.80 @ \$1.90.

Wire Nails.

The irregular condition of the Wire Nail market, to which we referred in our last issue, has continued and has developed some very low prices. The competition between the manufacturers is very animated and most of them are desirous of securing orders even at figures which are probably below the cost of the production. A good many buyers have already placed their orders, covering considerable quantities of Nails, but at this writing the tone of the market is apparently unchanged, it not having developed strength or showed a reaction from the low prices prevailing. The price for carload lots, f.o.b. factory, is \$2.25 to \$2.30, but it is intimated that these prices are shaded in special cases. Price from store may be named as \$2.40 to \$2.50 for small lots.

Our Pittsburgh correspondent telegraphs that Carnegie, Phipps & Co., of Pittsburgh, have leased the plant of the Hartman Steel Company, Limited, Beaver Falls, Pa. The plant will be operated by that firm under the name of Carnegie, Phipps & Co., Limited, Beaver Falls Mills. Secretary Wightman, of the Hartman Company, has resigned. The changes noted were to take effect on the 1st inst.

Miscellaneous Prices.

The following discount sheet has been sent out by the Stanley Rule and Level Company, New York, and New Britain Conn., under date January 1, 1889. It applies to the company's illustrated catalogue of January 1, 1888, to which two extra pages, 48½ and 50½, have recently been added and sent out to the Hardware trade. In addition to the discounts named below a discount for cash of 10 per cent. is allowed if the account is paid within 30 days.

	Dis. per cent.
Awl Hafts.....	45
Awls, Patent Pegging.....	45
Beader, Stanley's Universal.....	20
Bevels, Sliding T.....	60
Bevels, Patent Flush Eureka.....	30
Bit and Square Level.....	20
Box Scraper, Adjustable.....	30
Brad Awls, Handled.....	30
Clapboard Marker.....	20
Clapboard Gauge.....	20
Chalk-lines, Reels and Awls.....	30
Carpenters' Tool Handles.....	30
Chisel Gauge.....	20
Countersinks, Wheeler's Patent.....	30
Dado, Filletster, Plow, &c., combined.....	20
Dado, Adjustable.....	20
Gauges.....	60
Gauges, with Improved Face-Plate.....	60

Handles, Brad Awl.....	30	Try Squares, Iron Handle, No. 12.....	30
" Plane.....	40	" Inlaid, No. 10.....	30
" Saw.....	40	" Plumb and Level.....	30
" Screw Driver.....	50	Try Square and Bevel, Combination.....	30
Hammers, Magnetic.....	30	Try and Miter Square, Winterbottom's.....	30
" Tack, No. 4.....	30	Veneer Scrapers.....	40
" Steak.....	30	I. S. Spencer's Sons, Guilford, Conn., have appointed S. A. Haines, 90 Chambers street, New York, agent for the sale of their line of Locks, Latches, Door Sheaves, T-Scales, Counter Scales, &c. The following are their net prices for the Locks, Latches, &c., described below:	
" Upholsterers'.....	30		
Hollows and Rounds, for Plane No. 45.....	20	Horizontal Rim Lock, brass bolt and key, 3 x 5 inches.....	2.00
Level, Bit and Square.....	20	Horizontal Rim Lock, brass bolt and key, 3½ x 5 inches.....	2.30
Level Glasses.....	70	Horizontal Rim Lock, 3 brass bolts and keys, 3½ x 5 inches.....	2.85
Mallets, Hickory.....	20	Upright Rim Lock, iron bolt, tinned key, 4 inches.....	1.25
" Lignumvite.....	20	Upright Rim Lock, brass bolt and key, 4½ inches.....	2.25
Miter Box, Improved.....	20		
" Squares, Improved.....	30		
" Try Squares, Improved.....	30		
Odd-Jobs, Stanley's.....	20		
Plumbs and Levels, Non-Adjustable.....	70		
" " Patent Adjustable.....	70		
" " Nicholson's Patent.....	30		
" " Iron Frame.....	30		
" " Machinists'.....	30		
Pocket Levels.....	70		
Planes, Bailey's Adjustable, Iron.....	40		
" " Wood.....	40		
" " Block.....	40		

Names and Numbers.			Catalogue page.	Size of Roll.		Retail prices Each.	Wholesale prices. Per dozen.
				Length. Inches.	Diameter. Inches.		
<i>Superior Wringers, Iron Frames and Steel Springs. Warranted.</i>	No. 2,	Small Family Size	17	10	1½	3.50	22.00
	No. 3,	Medium Family Size.....	17	11	1½	4.00	26.50
	No. 4,	Large Family Size.....	17	12	1½	4.50	31.00
<i>Novelty Wringers, with Curved Clamp. Nos. 22, 33 and 44 have heavier frames and ironwork, as well as thicker Rolls.</i>	No. 2,	Small Family Size.....	3	10	1½	4.00	27.00
	No. 3,	Medium Family Size.....	3	11	1½	4.50	31.50
	No. 4,	Large Family Size.....	3	12	1½	5.00	36.00
	No. 22,	Large Family Size.....	5	10	2	5.00	36.00
	No. 33,	Ex. Large Family Size..	5	11	2	6.00	45.00
	No. 44,	Small Hotel Size.....	5	12	2	7.00	54.00
<i>Novelty Wringers, with Straight Clamp. Nos. 22½, 33½ and 44½ have heavier frames and iron- work, as well as thicker Rolls.</i>	No. 2½,	Small Family Size.....	3	10	1½	4.00	27.00
	No. 3½,	Medium Family Size....	3	11	1½	4.50	31.50
	No. 4½,	Large Family Size.....	3	12	1½	5.00	36.00
	No. 22½,	Large Family Size.....	5	10	2	5.00	36.00
	No. 33½,	Ex. Large Family Size..	5	11	2	6.00	45.00
	No. 44½,	Small Hotel Size.....	5	12	2	7.00	54.00
<i>Novelty Wringers, New Style. See Description Page 18.</i>	No. 10,	Small Family Size.	18	10	1½	4.00	27.00
	No. 11,	Medium Family Size.....	18	11	1½	4.50	31.50
	No. 12,	Large Family Size.....	18	12	1½	5.00	36.00
<i>Excelsior Wringers, with Folding Bench. Nos. AA, BB and CC have heavier frames and iron work, as well as thicker Rolls.</i>	No. A,	Small Family Size.....	7	10	1½	6.00	45.00
	No. B,	Medium Family Size.....	7	11	1½	6.50	49.50
	No. C,	Large Family Size.....	7	12	1½	7.00	54.00
	No. AA,	Large Family Size.....	7	10	2	7.00	54.00
	No. BB,	Ex. Large Family Size..	7	11	2	8.00	63.00
	No. CC,	Small Hotel Size.....	7	12	2	9.00	72.00
<i>Excelsior Wringers for Stationary Tubs. Nos. EE, FF and GG have heavier frames and iron work, as well as thicker Rolls.</i>	No. E,	Small Family Size.....	9	10	1½	5.00	36.00
	No. F,	Medium Family Size.....	9	11	1½	5.50	40.50
	No. G,	Large Family Size.....	9	12	1½	6.00	45.00
	No. EE,	Large Family Size.....	9	10	2	6.00	45.00
	No. FF,	Ex. Large Family Size..	9	11	2	7.00	54.00
	No. GG,	Small Hotel Size.....	9	12	2	8.00	63.00
<i>Excelsior Wringers, Laun- dry and Factory. Also, for the use of Sugar and Dye Houses. Have large capacity and are strong and durable.</i>	No. H,	Medium Hotel Size.....	11	12	2½	12.00	99.00
	No. HH,	Large Hotel Size.....	11	14	2½	15.00	126.00
	No. JJ,	Laundry or Factory.....	11	16	3	30.00	261.00
	No. KK,	Laundry or Factory.....	11	18	3½	40.00	351.00
	No. 00,	Laundry or Factory.....	13	14	4½	50.00	441.00
	No. 000,	Laundry or Factory.....	13	18	5½	100.00	967.00

Planes, Stanley, Adjustable Iron.....	40	3½-inch Rim Latch, iron bolt.....	1.00
" " Wood.....	40	3½-inch Rim Latch, iron bolt and steel bolt.....	1.10
" " Block.....	40	3½-inch Mortise Lock, brass bolts, nickel key.....	2.25
Plane Irons.....	40	4-inch Mortise Lock, brass bolts, metal key.....	2.85
<i>Miscellaneous Planes.</i>			
Planes, Beading.....	20	4½-inch Mortise Lock, brass bolt, metal key.....	3.25
" Beading, Rabbet and Slitting.....	20		
" Chamfer.....	20		
" Floor.....	20		
" Rabbet.....	20		
" Rabbet and Filletster.....	20		
" Router.....	20		
" Tonguing and Grooving.....	20		
" Victor Adjustable.....	20		
Plow, Filletster, &c., combined.....	20		
Plow and Matching Plane, Bull-Nose.....	20		
Plumb Bobs, Adjustable.....	30		
Roofing Brackets.....	20		
Rules, Boxwood, Stanley's.....	80		
" Ivory, Stanley's.....	50		
" Ivory, Stearn's.....	50		
" Miscellaneous, Stanley's.....	60		
Sash Cord Irons.....	30		
Scratch Awls Handled.....	30		
Screw-Drivers, Varnished Handles.....	65		
Pat. Improved Black Handles.....	60		
Screw-Drivers, No. 86.....	70		
Spoke Shaves, Bailey's.....	40		
Spoke Shave Cutters, Bailey's.....	40		
Trammel Points.....	30		
Trammel Points, for Rules.....	20		
Tool Handles and Tools, Excelsior.....	30		
Try Squares, No. 20.....	60		
" Adjustable, No. 14.....	30		

The Clothes Wringer Association met last week and a new list was adopted, to take effect January 1. This revision of the list was made necessary because since the former one had been adopted certain inequalities were developed on account of the varying cost of the goods, and the list now offered to the trade is designed to represent the market satisfactorily at the present cost of manufacture. It was agreed by the manufacturers that a uniform list should be printed for similar goods, a uniform discount having also been agreed upon. The foregoing is the list of the Bailey Wringing Machine Company, Woonsocket, R. I., which gives the new prices, and from which the discount is \$3 per dozen, instead of \$2.50, as from the former list, their being also a discount of 2 per cent. for cash in 10 days.

The Putnam Nail Company, Neponset, Mass., have adopted the following new list on their Putnam Horse Shoe Nails. It went into effect January 1, and is subject to a discount of 15 per cent., and 1 per cent. additional for cash in ten days.

No. 12.	10.	9.	8.	7.	6.
18c.	18c.	19c.	20c.	21c.	23c.
No. 5.	4.	3.	2.	1.	
26c.	50c.	1.00	2.00	3.00	

The following announcement in regard to the prices of Coes' Wrenches is made January 1 by J. C. McCarty & Co., 97 Chambers street, New York, and John H. Graham & Co., 113 Chambers street, New York:

We are instructed by the Coes Wrench Company to quote the following prices—viz., L. Coes & Co.'s Knife Handle Wrench, as well as A. G. Coes & Co.'s make, 55 per cent. discount from list. A special discount of 10 per cent. will be allowed on specified orders for 50 dozen for immediate shipment. Mechanics' Wrenches will continue to rate at 10 per cent. less than the Genuine, and are subject to the same quantity schedule. Terms, 90 days, or 3 per cent. cash, ten days. Parties having purchased the quantity will be entitled to the extra discount on subsequent orders during the balance of the season ending June 30, 1889.

The market for Manila and Sisal Rope remains practically as at our last report, the supply of the raw material being exceedingly limited and the prices firmly maintained. Some small holders who bought in anticipation of an advance are offering Rope at some concessions, but the demand is limited, most of the heavy buyers having anticipated their wants and others buying now only what they are compelled to.

The Tack market shows no important change, and there is some unevenness. A good deal of complaint is made on account of the extent to which light-weight goods are put on the market and some low quotations are to be explained in this way. There is animated competition between many of the manufacturers, resulting in the sending out of very low prices, which are conceded to yield little if any profit. Some of the well-known and conservative houses, however, like A. Field & Sons, American Tack Co., and Dunbar, Hobart & Whidden, refuse to meet the low prices that are current.

The manufacturers of Heavy Hammers and Sledges have been conferring with reference to an advance in prices and the market is regarded as firmer.

The Wire Cloth market is without material change, the best brands having been held pretty firmly, although at a slight decline from last season's prices. Some brands not so well or favorably known have been offered at lower figures. The jobbers have pretty generally placed their contracts, and it rests with them in good part to determine which will prevail next season. The outlook is that there will be a good demand for this line of goods, and the opinion is expressed that the market will be somewhat firmer when the time of delivery is reached. Referring to the quality of Wire Cloth, a manufacturer says:

It should remain with the manufacturers rather than the trade what the quality will be. If the manufacturer allows the trade to make the price we do not think they can reduce the quality fast enough to keep pace with their prices. The time has come when manufacturers must keep up the standard of quality or they must sell their goods at a proportionate reduction in price.

C. J. Kimball & Son, Bennington, N. H., show in their list the line of Drawing Knives, Cutlery and Screw Drivers, of which they are manufacturers. We are advised that their prices are as follows:

Drawing Knives, discount,	10 and 5 per cent.
Cutlery,	20 to 25 "
Screw Drivers,	20 to 25 "

Trade.

From Louisville, Ky., we have the following advices under date December 29:

The Hardware Trade of Louisville, Ky., has experienced the usual holiday lull. All salesmen have been in for a week, and are now busily preparing fresh samples for long trips. The past fall's business has been about the largest in the history of our city, and very satisfactory, on the whole, which status has stimulated the dealers to renewed energy. Low prices from manufacturers have caused the jobbers to purchase heavily, and they are distributing the goods into new territory in order to prevent overcrowded stocks, but there is no doubt that dealers, as well as manufacturers, are running on too close a margin, but they feel in a measure safe, as the general condition of the country is prosperous.

The anomaly continues of an enormous and strong consumptive demand on the one hand, and continued low prices and breaks from the factories on the other; this proves what a wonderful country we have in the South and West, which is fast being opened up to trade by new lines and extensions of the railroads. Prices generally have remained steady during the week, but some further concessions are looked for from the mills if Pig Iron does not stiffen up soon. This prime factor is watched by all classes of business, and is looked on as the barometer of trade.

Tendencies in Trade.

From a well-known wholesale hardware house in Ohio we have received the following interesting communication which relates to the question which has been discussed at some length by manufacturers and retailers as to the present tendency of trade as regards direct dealings between the manufacturers and the retail trade. We take especial pleasure in laying this communication before our readers as it is a clear statement of the question as seen from the jobbers' standpoint:

We have read with much interest the correspondence appearing in your paper during the last few months bearing upon the practice of the retail trade of the country in placing their orders. We are gratified to notice that the communications from retail dealers in our own immediate vicinity seem to express almost unanimously the opinion that their interests are best served by giving their business to a jobber, which we believe to be the proper view of the matter. We should like to submit three propositions as expressing our opinions and make a few remarks upon each:

First, The jobber is an essential to the retail dealer.

2d. The jobbers are compelled to submit to unfair competition in many instances; and

3d. The retail dealer can purchase his stock as a whole to better advantage from the jobber than by distributing his order to a number of manufacturers.

We must preface anything we say with the qualification that it applies only to ourselves and our practices, as we are not sufficiently familiar with the methods of our brother jobbers to speak for them, nor indeed have we any right to.

Our first proposition seems so plain that we hardly think it necessary to remark upon it further than to say that it is proven by the correspondence already published from both retail dealers and manufacturers.

The second proposition requires some explanation. In it we refer particularly to two matters: The competition on the part of manufacturers who labor under the delusion that they can market their goods direct to the trade at a price as low as they are willing or able to make to the jobber. These manufacturers, as a rule, are only short lived, but, unfortunately, for each one that dies another is born. From them the retailer usually secures the class of goods commonly known as "shopkeepers." The other unfair competitors are the manufacturers who desire to sell to the jobber,

and after having fully stocked him to go out and sell to his customers. We find this class of manufacturers offering to some retail dealers their quantity prices, and at the same time saying to them that they will make them the same price for such goods as they may require. They make sales in some instances, but in the majority of cases the only effect is to make a price at which the jobbers must sell. This practice is a growing evil, and the natural result is that buyers who are entitled to the lowest prices that can be made by jobbers are enjoying no better prices than those made to dealers who buy only a fraction of the quantities that they do. It is an accepted law of trade that the quantity should, to an extent, govern the price, and it is not right that dealers who buy one-twelfth of a gross should be entitled to as low prices as those who purchase in lots of one gross at a time.

Our third proposition is a broad statement which we must substantiate by facts. It is universally acknowledged that competition among jobbers is very keen, and it must therefore follow that prices are as low as they can afford to make, paying their expenses and securing a reasonable profit for themselves. We believe them to be lower, taking a miscellaneous invoice of, say, \$500, than the same goods can be bought for at the factories in the same quantities; we believe them to be as low as the same goods can be bought for at the factories in quantities, say, six times as great. We believe it so firmly that we are willing to substantiate the statement to any one who cares to try the experiment.

If our statement of the case is correct, then the truth of our third proposition is apparent, for the items of freight and express charges from 25 to 30 different factories would be found to add at least 5 per cent. to the cost of the goods.

In sending his orders to the jobber the dealer has the advantages of receiving his goods promptly; of receiving them in one lot at a minimum cost for freight; of conducting his business with a comparatively small stock, thus avoiding over-stocks and consequent financial embarrassment. The proper assortment of a retail stock in styles and quantities is just as essential a feature to success as in buying at lowest possible prices. We contend that the two objects can best be accomplished by judicious purchases from the jobber, and think that a little reflection and experimenting on the part of some of our correspondents who now think otherwise may prove to them that they are wrong.

For ourselves, we feel that our reputation with those who are now dealing with us is sufficiently established for fair dealing and low prices to warrant us in referring to them for the truth of whatever we have stated. We feel that we have a mission in the Hardware world, and are entitled to a living from it, and shall continue to use all honest endeavors to obtain it.

Referring to the manner of marketing their goods, a manufacturer in Minnesota writes as follows:

The jobbers were not inclined to take hold of our line very heartily, and wanted all the profits, so we concluded to introduce our goods at least to the retail trade. We are willing to sell to jobbers, but make no special effort to do so. We are inclined to think trade direct between the manufacturer and retailer is increasing, though we should prefer to deal with the jobber alone, as being less troublesome. One reason for manufacturers' inclination to deal directly with the retailer probably is that jobbers cut and make all sorts of prices, so that the retailer will not buy at all, because he has bought cheaper at some time, or has heard of those who have.

The following communication is from a well-known manufacturer "who has visited both the jobber and the retailer,"

and relates to the same question as seen from another point of view:

We think there is an increased tendency on the part of retail Hardwaremen to purchase direct from manufacturers, more especially of goods that are bulky and expensive to carry in stock. Each year finds more manufacturers on the road selling their products direct to the retail dealer or the consumer. The jobber has been arbitrary in the sale of certain makes of goods to the exclusion of all others, and has forced other manufacturers to go direct to the smaller trade. Over-production, and only a home market, compels all manufacturers to "hustle" for whatever trade they can get, either large or small. No matter how good an article a manufacturer has he can't get it recognized by a jobber until he has created a demand for it in the retail trade, then, if a demand is created, the jobber is willing to take hold and sell oftentimes at the manufacturers' prices, and want an extra per cent. or commission for so doing. This is one reason why manufacturers want to sell direct, for he not only saves commissions, extra per cents., &c., but he gains a recognition from the retail trade he wouldn't get through a jobber.

Items.

The Lawrence Curry Comb Company, 204 to 210 East Forty-third street, New York, are issuing their 1889 catalogue, which represents the large and important line of Curry Combs which they are manufacturing, including their most recent additions. Their Upright and Angular Boring Machines are also illustrated, attention being called to the advantages possessed by them. In regard to their Curry Combs, they call special attention to those which are made of steel.

J. W. McDonald, Cheboygan, Mich., issues a circular describing McDonald's Patent Improved Saw Tool for use in setting Cross-Cut Saws. He refers to the favor with which this tool has been received by the trade and users of saws, as evidenced by the rapidly increasing demand. He states that it has been much improved since last season and alludes to it as especially practical and an efficient device for the purpose. Full description is given with directions for its use.

E. C. Stearns & Co., Syracuse, N. Y., issue a neat card leaflet of unique design, in which their Stuart's Window Screen Frame is represented on the first page, a detailed statement of the extent to which the manufacture of this line has reached being given within.

As will be observed by the announcement of C. F. Guyon & Co., 99 Reade St., New York, in their advertisement on page 84 they are carrying a complete line of Bronzed Iron and Bronze Metal goods, which are referred to as entirely new productions and of exceptional quality. The detailed information in regard to this new departure will be of interest. They advise us that they will shortly publish a new catalogue embracing this entire line, which will also include all the new goods made by their several factories since the date of their last catalogue.

The E. C. Meacham Arms Company, St. Louis, Mo., under date December 21, issue their price current No. 395, which is occupied principally in the display of Breech-Loaders, Winchester Repeating Arms and Revolvers being also represented. The last page is devoted to Skates. The circular is accompanied by a key to the quotations which are given in cipher.

George N. Pierce & Company, Buffalo, N. Y., have issued their 1889 Catalogue, which represents their full line of goods, including Refrigerators in both pine and hard wood, Bird Cages, japanned and brass, and Tricycles, of which a large assortment is made for the use of girls and misses. It is to be noticed that several new patterns have recently been added in different departments, and a very complete line of goods is thus offered to the trade. The business was established in 1865, since which time it has been growing to its present dimensions.

The Freeman Wire Company, St. Louis, Mo., report a large demand for the season, and attribute it to the unusually mild weather. They refer to the past month as having been a busy one in all their departments.

For more than half a century Logan, Gregg & Co., Pittsburgh, Pa., have given their employees an annual banquet, and on the 29th ult. the 56th of these entertainments was given. Heretofore they have been held at the house of some member of the firm, but with the increase in the number of employees it has been found that no ordinary residence would comfortably accommodate them all, and on this occasion the families of the employees were also invited. The banquet was accordingly given in the Cyclorama dining hall and reception room, part of the entertainment of the evening being the viewing of the battle of Gettysburg. After the banquet, the excellence of which is referred to, there were other exercises, which are referred to as follows by the *Pittsburgh Post*:

First came the historian, Mr. Bruce Kountz, collector and assistant bookkeeper, who told of all that had happened during the year that had passed. He wound up in a blaze of glory with a description of stock taking, which occurs in December, and the close of which they were celebrating. He had been ably assisted in collecting data by the secretary, Miss Fanny Barndollar, the firm's efficient typewriter.

James H. Bissell, the colored gentleman who occupies the position of order clerk in the store, was the orator of the occasion, and sustained his part nobly. His subject was "Hardware Stores." The first establishment of the kind, he claimed, must have been at Jerusalem when Solomon built the temple. He said, however, that they never flourished luxuriantly in China, because these people had their own strange devices for putting houses together. Some one asked Mr. Bissell if he had ever heard where George Washington got his little hatchet. The sable orator promptly replied that the records showed the hatchet was purchased from Logan, Gregg & Co.

No small part of the entertainment was contributed by Mr. S. H. Lloyd, the bookkeeper, who had charge of the music. At the election which followed he was re-elected musician, and Miss Barndollar was again made secretary. Samuel Davis, bill clerk, was elected historian, and besides Mr. Bissell, who was unanimously re-elected, George McKenzie was chosen as next year's orator.

The following notice is issued to the trade under date of December 31, 1888:

The partnership heretofore existing between the undersigned as Merchant & Co., at 517 Arch street, Philadelphia, Pa., 9 Burling Slip, New York, N. Y., 202 Lake street, Chicago, Ill., 1 Whittington avenue, London, England, having this day expired by limitation, Barthold Bernheim now retiring, the business of Merchant & Co. will hereafter be conducted by Clarke Merchant and Henry W. Merchant, and the affairs of the late firm will be settled by them.

A Nelson, formerly conducting business under the style Salem Nail Company, 295 Pearl street, New York, has recently died, and the business will be carried on by O. Nelson at the same location.

C. R. Denckla, of the Heaton & Denckla Hardware Company, Philadelphia, Pa., a well-known Hardware merchant, of that city, died on the 18th ult.

We have received from the Chicago branch of the Kilmer Mfg. Company, of Newburg, N. Y., one of their calendars for 1889. It is handsomely lithographed in colors, and is intended to be hung on the wall, being bound with a metal strip at the top and bottom and backed with muslin. A table printed on the calendar shows the annual growth of the company's business since 1876, in which year they made 120,000 bale ties. The number has increased rapidly from year to year, until their production for 1888 is put at 59,739,000 ties. An accompanying circular gives a history of the operations of the establish-

ment, which has now grown to very large proportions. It is interesting to note that previous to embarking in this business the members of the firm were farmers in Schoharie County, N. Y., with little or no experience in manufacturing. Their bale ties have a very wide use for baling hay, straw, &c., and they also make ornamental fencing.

The Stanley Rule and Level Company claim that the vexed question whether eight hours is a day's work can be settled sooner by a careful selection of tools with which to do the work than by waiting for legislation on the subject. Their full-page advertisement in another part of this paper offers plenty of illustrations in support of this theory.

W. D. Gold, 1920 South Twelfth street, Philadelphia, Pa., is calling attention to his Smoothing and Polishing Iron Combined. The illustrations given of this article indicate its special features and utility.

The Red Jacket Pump Company, Daventry, Iowa, issue a striking colored lithograph, calling attention to their Red Jacket Adjustable Force Pump and the Lafferty Patent Chain Pumps, with illustrations showing the special features and uses of these goods. The catalogue of the company gives a detailed description of their manufactures, with directions for their use.

The 1889 catalogue of the Moore Mfg. and Foundry Company, of Milwaukee, Wis., illustrates in good style their line of Hangers, Vises, Tackle Blocks, Hay Fork Pulleys, Differential Pulley Blocks, Hand Hoists, &c. In connection with a reference to the removal of their business from Chicago to Milwaukee last July they state that their new plant has been erected with a special view to the manufacture of the lines of specialties shown in their catalogue, calling attention to their factory as well equipped for making light and medium Gray Iron Castings, with ample facilities for japanning and forging and for light machine work.

The Rockford Bit Company, Kokomo, Ind., issue a large-paged pamphlet describing their Wood-Boring Tools, including a large variety of Bits, together with Molding, Carving and Dovetailing Cutters, &c., Dado Heads, Hollow Augers and other Tools.

The St. Nicholas Mfg. Company, H. B. Owsley and H. Owsley, proprietors, 784-794 Madison street, Chicago, Ill., issue a catalogue representing the interesting line of Hand Sleighs, Desks, Rocking Horses, Express Wagons, Perambulators, Velocipedes, &c., which they manufacture.

E. Blair, Bucyrus, Ohio, issues striking and entertaining colored lithographs, in which the pictorial part is utilized to call attention to his line of Hog Rings and Rings. In a circular to the jobbing trade he states that this year he will have no agents, but solicits orders by mail.

The National Horse Nail Company, Vergennes, Vt., have issued their attractive calendar for 1889. In connection with the pictorial display they give full-sized cuts of the different sizes of Horse Nails, with both short and regular heads.

The Weir Plow Company, Monmouth, Ill., have issued a new catalogue very tastefully printed with exceptionally fine illustrations, in which they represent their line of Plows, Cultivators, Harrows and other Agricultural Implements and Machines. Among the new goods we observe the Weir Tongueless Riding or Walking Three-Wheeled Gang Plow. The company also send out a smaller pamphlet, describing some of their leading Plows, Harrows, &c., with blank pages for mem-

orandum. The company have branch houses at Kansas City, Mo., Dallas, Tex., and Council Bluffs, Iowa.

S. L. Allen & Co., 127 and 129 Catherine street, Philadelphia, Pa., have issued their 1889 Implement catalogue, describing the Planet Junior and Fire Fly Farm and Garden Implements, of which full descriptions are given, with abundant illustrations showing their use.

C. F. Guyon & Co., 99 Reade street, New York, are calling attention to their Nonpareil Sidewalk Ice Chisels, which they refer to as manufactured from the best English Steel. This Ice Chisel is of a heavy pattern and handled, and they allude especially to the low prices at which it is offered

Traveling Men's Association.

The Northwestern Traveling Men's Association held its thirteenth annual meeting in Washington Hall, National Union Building, Chicago, on the 28th ult. The attendance was unusually large, and nearly every State north of the Ohio River was represented. J. C. Miller presided and C. H. Hinman acted as secretary. The session was opened by the address of the president. In the course of his remarks he referred to the record of the association. During the past year the membership had decreased 30, which was due to the unusually large death rate. The number of deaths for the past year was 35, against 25 for the year previous. He recommended that the association change its mode of assessment. Instead of assessing whenever a death occurred, he thought it would be better to fix upon a regular period, say every 60 days. In conclusion, he hoped the members would bear in mind that all differences between the members at this meeting were simply differences as to the mode of helping the association and advancing its interests.

The report of Secretary and Treasurer Hinman followed the executive's address. According to his report \$177,000 had been collected in 21 assessments of \$2 each, and one expense assessment of \$1. Of this money \$155,000 was paid out to 31 widows and heirs of deceased members, and \$9000 to expense, leaving a balance of \$12,000, of which \$2000 belonged to the expense fund and \$10,000 to the mortuary fund. The average age of the members of the association was 40.17 years. The membership last year was 3909, of which number 171 had been admitted since the opening of the year. The number of deaths was 35, and delinquents dropped from the roll numbered 175, leaving 3870 members in the association at present.

C. H. Crossette, B. C. Prentice and M. A. Scovell, composing the Financial Committee, stated that they had gone over the books of the secretary and treasurer from December 24, 1887, to December 24, 1888, and that they were correct. The discussion of proposed amendments to the constitution occupied the remainder of the morning's session. The principal speech was that of T. S. Quincy, who advocated an amendment to the constitution to place the association on a graded assessment basis, to assess members according to their age. He also favored the payment of a commission to members for all applications for membership which they forwarded. The afternoon session convened at two o'clock. A discussion in regard to the election of officers was the first matter of interest after the meeting was called to order. The vote was then taken by ballot, the result to be announced by the Election Committee at the evening session.

A motion to present President J. C. Miller with \$1000 for the able manner in which he has fulfilled the duties of his office caused a spirited discussion. Some opposed paying anything, on the ground that it was unlawful, and that it would cause a scramble for the office if a monetary consideration was given. Others wanted the sum reduced to \$500. When it came to a vote, however, the \$500 party prevailed, and that sum was ordered paid. At the evening session the result of the election was announced as follows: J. C. Miller, president; C. H. Hinman, secretary and treasurer; W. M. Haskell, O. D. Frary, George Reed, D. K. Clink and F. F. Haigh, directors; vice-presidents—Illinois, W. H. Cribben; Wisconsin, John Throne; Indiana, J. B. Heywood; Ohio, Henry Rindskoff; Kentucky, N. M. Uri; Minnesota, D. R. Hevener; Michigan, Thomas Macleod; Iowa, C. M. Hinsdale; Missouri, M. C. Wetmore; Dakota, J. R. Robertson; New York, C. B. Howe; Colorado, William M. Gamble; Nebraska, M. A. Newmark; Kansas, D. E. Good; California, John Newberry; Montana, W. G. Paine. But one of the ten proposed amendments to the constitution was

adopted, and that was the amendment of Section 2 in Article V, which now reads:

The Board of Directors may order an assessment of not over \$1 upon each member of the association for expenses, when needed.

A number of lively speeches were indulged in by enthusiastic members, relative to improving on the gathering next year. The general opinion seemed to be that the business of the association could be much more expeditiously disposed of, and much more satisfactorily, if the annual meeting were changed to a delegate body. It was agreed that an amendment to the constitution making such a change would be offered at the next meeting. The association then adjourned to meet in Chicago, December 27, 1889.

Business Rules.

We have the pleasure of laying before our readers the following rules and regulations which have been adopted by a well-known wholesale Hardware house, by whom they are issued in the form of a convenient and well printed pamphlet. It will be observed that they are carefully compiled, and enter into a good many details which will doubtless be suggestive:

RULES AND REGULATIONS GOVERNING THE HARDWARE BUSINESS OF DUDLEY BROTHERS & LIPSCOMB, NASHVILLE, TENN.

BOOKKEEPERS.—ARTICLE I.

Section 1. Bookkeepers shall balance cash every day, and keep a book for that purpose, showing each day's balance, and they shall be prepared at any time to show that the cash on hand equals the balance the books call for. If there is a shortage they are liable for the amount of said shortage.

Sec. 2. Bookkeepers shall be liable for all counterfeit money that comes into the house, except what comes through the front cash drawer or city sales.

Sec. 3. Bookkeepers shall be liable for money received for by them and not credited to the payer; and they shall be liable for any other mistakes that may occur through their negligence.

Sec. 4. Bookkeepers shall be required to have an expense book from each and every traveling salesman before making settlement with him.

Sec. 5. Said expense book shall be filled out as provided for in Art. XIX, Secs. 7 and 8.

Sec. 6. Bookkeepers settling with traveling salesmen without the necessary collection and expense books, filled out as provided for in Art. XIX, Secs. 7 and 8, shall be guilty of a violation of rules as much so as the traveling salesman.

Sec. 7. Bookkeepers shall not be liable for money accepted by traveling salesmen, to be paid to other parties, except as provided for in Art. IV, Sec. 2.

Sec. 8. Bookkeepers shall be required to keep the collection and expense books of the traveling salesmen on file, and these books shall be the bookkeepers' sole and positive authority for all the entries made on the traveling accounts of the salesmen.

Sec. 9. Bookkeepers shall furnish traveling salesmen with statements, as provided for in Art. XIX, Sec. 11.

Sec. 10. Bookkeepers shall furnish the other employees of the house with information, as provided for in Art. VIII, Sec. 16.

Sec. 11. Bookkeepers shall pay employees their salary, as provided for in Art. VIII, Sec. 20.

Sec. 12. Bookkeepers shall not all leave the office at the same time. During business hours there shall always be at least one of them in the office.

BILL CLERK.—ARTICLE II.

Section 1. Bill clerks, in making charges on the country sales books, shall say who sold the bill, and whether it is an order given to a traveling salesman or if it is a bill sold in the house. If it is an order from the customer by mail, bill clerks shall say order by mail.

Sec. 2. In making charges on the city sales books the bill clerk shall give the salesman's name, and give post-office address of all new customers. If the order come by telephone, bill clerks must say so, and give name of the person who telephoned the order.

Sec. 3. Every charge offered to the bill clerk for entry on the sales books shall show who called the goods, who checked them, who packed them, and by whose authority the order is filled. No order or bill shall be entered on the sales books without this.

Sec. 4. If the bill clerk charges a man or firm merely "to merchandise," without giving the items, the bill clerk is security for the payment of the bill.

Sec. 5. It is the duty of the bill clerk to ask for the necessary information, and if such information is withheld or delayed the bill clerk shall not enter the bill.

Sec. 6. The failure of the bill clerks to adhere to these requirements shall make them liable for any loss that may ensue.

CITY BILLS.—ARTICLE III.

Section 1. City bills shall be marked "O K" by the person making the purchase, at the time the purchase is made, and said bill shall then be put on the city bill file.

Sec. 2. No bill shall be put on said file upon which an alteration or deduction is made, but when the bill needs correction a corrected bill shall be obtained, marked "O K," and the old bill shall be destroyed, and the corrected bill put on said file.

COLLECTIONS.—ARTICLE IV.

Section 1. If a traveling salesman collect money on the road and enter said collection in his collection and expense book, and said collection be not credited to the payer, said collection shall be charged to the bookkeeper making the settlement with said traveling salesman; but if said collection does not appear in said traveling salesman's collection and expense book, said collection shall be charged to the traveling salesman.

Sec. 2. Money accepted by traveling salesmen from their customers, to be paid to other parties must be entered in their collection and expense book, with full instructions as to whom and for whom said money is to be paid.

CONVERSATIONS.—ARTICLE V.

Section 1. Conversations with partners or employees in the house or over the telephone, except upon business, shall not exceed five minutes. Conversations with bookkeepers or bill clerks, except on business, interferes materially with their work and shall not be allowed.

CREDIT CLERKS.—ARTICLE VI.

Section 1. The credit clerk shall keep a true record of all goods returned, and shall enter them on his credit book, giving the date they came in.

Sec. 2. If the goods are returned without authority they are to go on the credit book in a separate place from the authorized credits, and remain as a memorandum until the credit clerk is authorized to enter them for credit.

Sec. 3. When goods are handed to an employee of the house, other than the credit clerk, it shall be the duty of the person receiving such goods to report them at once to the credit clerk.

CUSTOMERS.—ARTICLE VII.

Section 1. Customers shall be treated courteously and with careful and patient attention. Short answers or "smart Alex" replies shall not be made.

Sec. 2. Customers presenting receipts for money not credited to them shall be credited with the amount the receipt calls for, and said amount shall be charged to the person who signed the receipt.

Sec. 3. All orders or bills sold to new customers on credit shall be marked "O K" by a member of the firm or by one of the bookkeepers.

EMPLOYEES.—ARTICLE VIII.

Section 1. Employees shall bear in mind that time misspent by them, or work done to no purpose, is an actual cash loss to the firm. They shall, therefore, be required to work steadily and systematically during business hours.

Sec. 2. Employees shall be required to keep the firm's interests always in view, and to work to that end.

Sec. 3. If any person employed by the firm show a disposition to shirk his general or specified duty, or to consume his time merely with a view of acquiring a nominal right to draw his salary, he shall be declared worthless to the firm and shall be discharged without notice.

Sec. 4. Employees shall be provided with tablets to be used for figuring, writing dray tickets and such like purposes.

Sec. 5. Any and all persons shall be forbidden to use bill heads or other stationery except for legitimate purposes, and any person mutilating order books, cash books, sales books or stationery shall be charged with the same.

Sec. 6. Employees shall bear in mind that they shall complete any order given them to get up, and when the porters are otherwise employed the orders shall not be delayed by waiting for the porters to get out the rough articles.

Sec. 7. Each employee shall feel an interest in the general welfare of the firm, as provided for in Section 2 of this article, and shall not willingly see a loss sustained by the firm, or an article damaged, merely because it is not in the section of stock assigned to him.

Sec. 8. Employees shall have goods for their own use at cost and carriage, but goods sold to friends, or bought by employees for their friends, must be charged regular.

Sec. 9. Employees shall bear in mind that postage stamps are the same as money, and that

it is proper for them to bear the expense of their personal correspondence.

Sec. 10. Mr. — shall have charge of the entire stock, and he shall be held responsible for the proper care and management of the stock.

Sec. 11. It is the duty of the said — to assign each employee a certain section of the stock, and each employee will be required to keep his section in good order and condition.

Sec. 12. The failure of an employee to keep his section of stock in good order and condition shall be at once reported by said — to the firm, and, upon conviction, the employee thus reported shall be dealt with as provided in Section 3 of this article.

Sec. 13. The failure of said — to report the failure of an employee to keep his section in good order and condition shall make said — equally liable with the employee.

Sec. 14. All goods taken out of their place and not sold shall be put back by the person who took them out.

Sec. 15. No goods or broken packages shall be left on the running board.

Sec. 16. None of the employees except the bookkeepers shall be allowed behind the railing in the rear office, but they shall ask the bookkeepers for any information they (the employees) may need in relation to the business.

Sec. 17. Employees shall be forbidden to take out of stock any tool, implement or merchandise to be used in the store or loaned out.

Sec. 18. Any employee using merchandise, implement or tool in violation of Sec. 17 of this article shall be charged with what he uses at regular prices.

Sec. 19. If any employee, receiving goods to be credited to a customer, fails to deliver same to the credit clerk, the said employee shall be charged with said goods when customer claims credit for them.

Sec. 20. Employees shall not overdraw their salary, but they shall have the privilege of drawing their money through the month as their convenience suggests. They are requested, however, to make as few demands as possible on the bookkeepers.

Sec. 21. Employees shall not buy goods for their own use and have them charged to the firm.

Sec. 22. Employees will be required to select their wearing apparel with a reasonable regard for the duties they have to perform, so as to avoid changing their dress during business hours.

MAIL.—ARTICLE IX.

Section 1. No mail shall be left or opened in the front office.

Sec. 2. It shall be the duty of the person bringing the mail from the post office, or receiving it from the postman, to take it to the rear office at the time and in the condition he receives it, and it shall remain in the rear office, untouched, until it is opened by some one authorized to do so.

MISTAKES.—ARTICLE X.

Section 1. Mistakes reported by mail or otherwise shall be traced to the person who made them, and said person shall correct the mistakes and report them to the bookkeeper.

Sec. 2. If a loss is caused by the mistake said loss shall be charged to the party who made the mistake.

ORDER AND DECORUM.—ARTICLE XI.

Section 1. Order and decorum shall be maintained at all times.

Sec. 2. No boisterous talking, laughing or improper language shall be tolerated at any time.

PACKING. ARTICLE XII.

Section 1. Mr. — shall be furnished with packing tickets, printed so as to show who got out the goods, who they were called by, who they were handled by, who packed them and who shipped them. Said tickets shall contain printed instructions to the purchaser to return said ticket to the firm in all cases where the goods do not check with his invoice.

Sec. 2. It shall be the duty of the person getting up an order to see that a ticket, filled out as specified in Sec. 1 of this article, is placed in the box.

PARTNERS.—ARTICLE XIII.

Section 1. The rules of the house, as far as applicable, shall govern the partners as well as the employees.

PORTERS.—ARTICLE XIV.

Porters shall not be allowed to have company at dinner time, and shall conduct themselves as required by Sec. 2 of Art. XI.

RECEIVING CLERKS.—ARTICLE XV.

Section 1. Receiving clerks shall keep a true record of all goods that come into the house, and shall keep a book for that purpose, known as the receiving book.

Sec. 2. Said Receiving book shall show when the goods came in, what railroad, steamboat or wagon they came by, and the amount of the freight bill.

Sec. 3. Receiving clerks shall check up the invoices on receipt of the goods, and report any shortage, breakage or irregularity as soon as it is detected.

Sec. 4. When there is an invoice that cannot be checked, the receiving clerk shall report the fact at once, and get instructions in relation to said invoice.

Sec. 5. Receiving clerks shall see that the rate of freight charged in the freight bill agrees with the rate in the bill of lading, and shall mark each completed freight bill O K, and attach said completed freight bill to the bill of lading that goes with it.

SALESMEN.—ARTICLE XVI.

Section 1. Salesmen extending credit without authority shall be responsible for the amount.

Sec. 2. The salesmen can avoid the responsibility of trusting customers whose credit is unknown to them by referring such cases to a member of the firm or to the bookkeepers.

Sec. 3. It shall be the duty of the salesmen to give the necessary information to the bill clerk, as required by Art. II, Secs. 1, 3 and 5.

Sec. 4. Salesmen shall furnish the bookkeepers with such information in regard to their customers as the bookkeepers may deem necessary.

Sec. 5. If a salesman hear a report, or come into possession of any facts that will probably affect the credit or solvency of his customer, it shall be the duty of the salesman to advise the bookkeeper at once of such rumor or facts.

SHIPPING.—ARTICLE XVII.

Section 1. There shall be a book known as the shipping book, and it shall be the duty of the man who handles the goods in the bill to enter on said shipping book the buyer's name and his shipping directions, and his calls at other houses, if any; and to state on said book the number of cases and packages, giving their weights, and to give a description of such articles as are not packed in boxes or put in packages—in other words, the man who handles the order must enter it on the shipping book in such manner that the bill of lading can be made from the shipping book, and not from memory or from "the pile of goods."

Sec. 2. If the goods go by wagon the wagoner must sign said shipping book the same as he would sign the wagon receipt book.

Sec. 3. It shall be the duty of any person receiving one or more packages to be shipped with our goods to enter said packages on said shipping book.

Sec. 4. Said shipping book shall state who the package or packages came from, and shall show that they were packed with our goods.

SHIPPING CLERK.—ARTICLE XVIII.

Section 1. Shipping clerks shall send a bill of lading along with the invoice of each shipment.

Sec. 2. When shipping a number of articles tied together, or made into a bundle, shipping clerk shall state the number of articles in the bundle.

TRAVELING SALESMEN.—ARTICLE XIX.

Section 1. Traveling salesmen shall be furnished with order blanks, and shall write only one order on each blank. All orders shall contain full shipping directions, and terms of sale. The orders shall be written plainly and explicitly, and give price of each article.

Sec. 2. Nothing shall be written on the paper containing the order that does not refer exclusively to the order; and no one shall be bound to enter a credit written at the bottom of an order.

Sec. 3. Traveling salesmen shall be furnished with printed blanks to make reports on their customers, and shall be required to send in a report on every new customer they sell. The blanks for this purpose shall be printed in a manner that will leave no doubt as to what is required of the traveling salesman.

Sec. 4. All traveling salesman shall use due diligence to obtain information that will enable them to fill out the statements and questions printed on the blanks, and shall write on the back of the report any other information he can obtain, together with his own opinion of the purchaser's means, character, habits and business capacity.

Sec. 5. All that the traveling salesman has to say in relation to the purchaser's credit or history shall be written either in the face or on the back of the report, and not in his letter to the firm or on the order.

Sec. 6. The traveling salesman's failure to send a report with an order from a new man to be filled on credit shall be taken as evidence that the salesman can find no reason for recommending said new customer for credit, and the order shall not be filled, except upon the salesman's guarantee.

Sec. 7. Traveling salesmen shall be furnished with blank books in which to enter all collections and disbursements while on the road, and they shall be required to send said books to the house at the end of each week; said books

shall say where to reach the salesman by letter.

Sec. 8. All discounts, rebates or allowances of any kind made by the traveling salesman while on the road shall be entered in said books.

Sec. 9. Traveling salesmen passing customers who owe bills that are due shall be required to report failure to collect as promptly as they would a collection, and to report reasons given or promises made.

Sec. 10. Traveling salesmen shall keep the house advised as to the propriety of bringing suit against or of refusing to sell delinquent debtors.

Sec. 11. Traveling salesmen wanting statements of their customers' accounts shall hand the bookkeeper a list giving names of such customers, and write on said list when the statements will be called for. List shall be handed to the bookkeeper in time for him to have them ready at the date they will be called for.

Sec. 12. All traveling salesmen, when not on the road, shall assist in the general work of the house, the same as other employees.

Sec. 13. All traveling salesmen bringing in orders shall copy them on the regular order blanks, and shall, with the proper assistance, get said orders up.

Sec. 14. All traveling salesmen, no matter upon what basis, shall be subject to the rules of the house.

ARTICLE XX.

Section 1. The foregoing rules have been drafted in good faith and due consideration for the rights and privileges of the employees. Therefore a rigid observance of said rules is expected and shall be enforced.

Sargent & Co.,

New York and New Haven, Conn., have issued their discount sheet No. 2 under date January 1, 1889, which applies to their 1888 catalogue. We print below the portion which refers to goods of their own manufacture, which will be interesting as showing the extent of their line, and also their carefully revised quotations. In connection with this discount sheet it is announced that the old cash discount is discontinued and that the goods will now be invoiced at *net prompt cash rates*, which are the equivalent of their former invoice discounts and the cash discount combined. Their invoices will, therefore, in future be subject to no cash discount as heretofore, and it is stated that if payment is not received within 30 days from date they will draw at sight for the amount of the account. The trade will note with unusual interest this change, the 10 per cent. cash discount having been given for many years, so that its discontinuance is an important new departure, which will doubtless receive the approval of the trade.

Their list of Door Knobs, Locks, Escutcheons, &c., is also issued, the discount for which is 55, 10 and 2 per cent. The following are the discounts on the goods contained in the first 858 pages of their catalogue, and, as noted above, the prices given are net:

	Dis. per cent.
Door Bells: Nos. 34 to 15, 143 to 145, 153 1/2 to 115, 243 1/2 to 245, 203 1/2 to 206, 203 1/2 to 215, 213 1/2 to 215, 210 3/4 to 215, 223 1/2 to 225, 223 1/2 to 225.....	60&10
Lever for Door Bells.....	60&10
Side Bell Pulls.....	55
House Bells on Carriages.....	50
Alarm Door Bells.....	60&10
Door Knockers.....	70
Check Springs.....	70
Bell Cranks.....	60
Mortise Bell Cranks.....	60
Pulley Bell Cranks.....	60
No. 20, Narrow Fast Joint Butts.....	55
No. 20, Broad Fast Joint Butts.....	60
Loose Joint Butts: Nos. 50, 152, 153, 156, 158, 159, 53, 58.....	70&10
No. 456, Boston Finish Butts.....	85
No. 456, Yeldo Bronzed Butts.....	80&10
No. 458, Boston Finish Butts.....	85
No. 458, Yeldo Bronzed Butts.....	80&10
No. 402A, Berlin Bronzed Butts.....	80&10
No. K402A, Tokio Bronzed Butts.....	80&10
No. Y402A, Yeldo Bronzed Butts.....	80&10
No. Y18, Yeldo Bronzed Butts.....	80&10
No. K75, Bronze Metal.....	75
No. K80A, M800A, Bronze Metal Butts.....	70
No. K86A, M805A, Bronze Metal Butts.....	70
No. C880E Bronze Metal Butts.....	70&10
No. 1591, Brass Butts.....	71
No. 1591P, L1591P, Bronze Metal Butts.....	70
No. 1593, Brass Butts.....	70
No. 1593P, L1593P, Bronze Metal Butts.....	70
Loose-Pin Butts, Nos. 42, 43, 142, 143, 146.....	70&10
Loose-Pin Butts, Nos. 148 and 149.....	70
No. T435, Tuscan Bronzed Butts.....	80&10
No. 435, Berlin Bronzed Butts.....	80&10
No. P137, Copper Plated Butts.....	80
No. 130, Boston Finish Butts.....	85
No. Y18, Yeldo Bronzed Butts.....	80
No. 442A, Berlin Bronzed Butts.....	80
No. K442A, Tokio; No. Y442A, Yeldo Bronzed Butts.....	80&10

No. 446A, Berlin Bronzed Butts	80	Cupboard or Locker Catches	60	Molding Hooks	60
No. K446A, Tokio; No. Y446A, Yeddo; No. Y433A, Bronzed Butts	80&10	Showcase Catches	60	Curtain Pins	60
No. 7436A, Tuscan Bronzed Butts	80	Brass Cupboard Catches	60	No. 5, Picture Nails	60
No. 436A, Berlin Bronzed Butts	80	Cupboard Catches, pages 382-385	60&10	No. 4, Picture Nails	60&10
No. K436A, Tokio, 437A, Berlin, Bronze Metal Butts	70&10	Cupboard Catches: Nos. 382, 387, Nos. 372 to 479	60&10	No. 50, 60, Picture Nails, Nos. 10 & 11	40
No. 836A, M336A, Bronze Metal Butts	75	Cupboard Catches, page 387	60&10	Picture Knobs	70
No. 834, M334, Bronze Metal Butts	75&10	Cupboard Catches: Nos. 382A, 1492A, 1892A, M1892A, 483A, 893A, 494A, 894A	60&10	Drawer Knobs	60
No. 845A, M845A, Bronze Metal Butts	70	Nos. K1492A, Y1492A	70	Stove Knobs	60
No. 845E, Bronze Metal Butts	70&10	Nos. T442A, 442A	60, 10, 10	Shutter Knobs, pages 561-563	70
No. 1541, Brass Butts	70	Nos. K442A, Y442A	70&10	Shutter Knobs, pages 564-566	60&10
No. 1541P, L1541P, Bronze Metal Butts	70	Nos. T445A, 445A	60, 10, 10	Sash Knobs	60&10
No. 1543, Brass Butts	70	Nos. K445A, Y445A	70&10	Sash Lifts, page 567	60&10
No. 1543P, L1543P, Bronze Metal Butts	70	Nos. 402, Y402, 802P	60&10	Sash Lifts, page 570	60&10&10
Mayer's Hinges	70&10	Nos. 821P, L821P, C821E	60&10	Sash Lifts and Locks:	
No. 290, Parliament Butts	70&10	Cupboard Catches, page 390	60&10	Nos. 501, 701, T462, 462	60&10
No. 293, 298, Parliament Butts	75	French Window Catches	60	Nos. K462 and Y462	70
No. 590, 790 Parliament Butts	70	Transom Catches	60	Nos. 862, T460A, 460A, M860A and M870A	60&10
No. 1492A, &c, Parliament Butts	70	Cupboard Turns, pages 398, 397	60&10	Nos. K460A and Y460A	60&10
No. 2965A, &c, Parliament Butts	70	Cupboard Turns, pages 398, 401	60, 10, 10	Flush Sash Lifts, Tuscan and Berlin Bronzed, Tokio and Yeddo Bronzed, Bronze Metal and Imperial	60&10
Parliament Butts	70	Closet Catches	70&10	Ekado Sash Lifts	60&10
Inside Shutter Hinges	70	Screen Door Latches	60, 10, 10	Plain Sash Lifts	60&10
Inside Shutter Hinges: Nos. 410&411	65&10	Screen Door Catches, Nos. 200, 400	70	Window Pulls	60&10
Nos. 810&811	60&10	Screen Door Catches, Nos. 8201 to 8801	75	Sash Pull Plates	60&10&10
No. 415A	65&10	Screen Door Catches: Tuscan and Berlin Bronzed	70&10	Sash Pulls	60&10&10
Nos. K415A & Y415A	65&10	Tokio and Yeddo Bronzed	75	Sash Pulls and Plates	60&10&10
Nos. K415A & M815A, Nos. 815P & L815P	65&10	Screen Door Catches, page 405	70	Shutter Bars, No. 0	60&10
Nos. 420&420, No. 425A	70	Screen Door Catches, page 406	70&10	Shutter Bars, No. T55, &c	60&10&10
Nos. K425A & Y425A	70&10	Screen Door Catches:		Shutter Bars, Nos. 107, 105	60&10&10
Nos. 825A & M825A, Nos. 823P & L823P	70	T6410 to T6415, 6410 to 6415	70	Shutter Bars, pages 583, 584, 586, 587	60&10&10
Inside Shutter Hinges, Loose Pin	65&10	T6412 to T6417, 6412 to 6417	60&10	Shutter Bars, pages 586, 588, 589	70
Inside Shutter Hinges, Loose Joint: Berlin	65&10	Window Screen Corner Brackets	70&10	Window Spring Bolts, Nos. 10, 15, 20	70
Bronzed Metal	70	Drinks	70&10	Window Spring Bolt Sockets	70
Loose Pin Surface Butts	70	Chain Door Fast, page 410	65&10	Window Springs, Nos. 0 to 7, 19, 17	60&10&10
No. 400, Refrigerator Hinges, No. 800	55	Chain Door Fast, page 411	60&10	Sash Fast and Props	60
Surface Spring Hinges, Single	60&10	Ladd's Door Fast	60	Sash Fasteners, pages 592, 593, 594	60&10
Double	60&10	Letter-Box Plates	60, 10, 10	Sash Fasteners, page 596	70&10
Surface Spring Hinges, page 281	60	Letter-Box Plates, Ekado Design	60, 10, 10	Sash Fasteners, page 598	60&10
Batchat Surface Spring Hinges	60	Letter-Box Plates, Plain Bronze	60, 10, 10	Sash Fasteners, Nos. 50 to 165	60&10
Mortise Spring Hinges	60	Letter-Box Plates, Ekado Design	60, 10, 10	Nos. 82 to M98	70&10
Model Spring Hinges	60&10	Name Door Plates	60&10	Sash Fasteners, page 598	70
Royal Spring Hinges: Japanned	60&10	Number Door Plates	60&10	Sash Fasteners: Nos. K532, Y532	60&10
Bronze Metal	45	Japanned Door Handles	60	All other numbers, page 599	60&10
Eclipse Door Springs	55	Roggin's Thumb Latches	60&10	Sash Fasteners: Nos. K574 A, Y574 A	60&10
Eclipse Door Checks	55	Bronzed Door Handles, Nos. 21, 22, 23	60	All other numbers, page 600	70
View Door Springs	60	62, 65, 67	60&10	Sash Fasteners, page 601	75 & 10
Champion Door Springs	60	Barn Door Latches	60	All other numbers, page 602	60&10
Torrey Door Springs	60	Barn Door Latch and Latch	60&10	Sash Fasteners, page 604	60&10
Rubber Door Springs	60	Store Door Handles, Japanned	60&10	Nos. T950A to M958A	75
Strap and T Hinges	75	Bronzed, pages 428, 430	60&10	Nos. T1064A to M1068A	75
Crate Hinges	75	Bronzed, page 420	60&10	Sash Fasteners, page 606	75&10
Hinge Hinges	75	Store Door Handles, pages 431, 437	60&10	Transom Lifters, Copper Finished	45
Crate Hinges	75	Pages 438, 439	60	Nickel Plated	60&10
Galvanized Strap and T Hinges	70	Store Door Handles and Lock	70	(Yeddo Bronzed at same price as Nickel Plated.)	55
Galvanized Hinge Hinges	70	Store Door Handles, pages 442 to 445	60, 10, 10	Crescent Transom Lifters	55
Trap Door Hinges	60&10	Store Door Handles and Lock: Bronzed Handles	60, 10, 10	Lever	60
Nos. 100, 102, Plate Hinges	10	Bronze Metal Handles	60, 10, 10	Sash Centers	60&10
No. 58 Hook and Eye Hinges	60	Store Door Handles and Lock	60, 10, 10	Stubs and Plates	60&10
Nos. 98, 108, Hook Hinges	10	Page 459	60&10	Shutter Screws	60
Nos. 75, 79, Welded Hook Hinges	60	Store Door Dead Lock Handles	60&10	Shutter Lifts	60
Boiled Plate Hinges	60	Flush Barn Door Pulls	60, 10, 10	Sash Rollers	60&10
Boiled Plate Hinges	60	Door Pulls, page 468, 469	60&10	Shutter Sheaves	60&10
Turn Buckle Hinges	60&10	Japanned Barn Door Pulls	60	Sliding Door Sheaves	70
Drops and Pins	70&10	Door Pulls, pages 465-465 1/2	60	Hatfield Pattern Sheaves, Nos. 60, 65	70&10
Blind Fastenings	60	Bar Handles	60&10	Sliding Door Stops	70
Blind Hinges, Nos. 1, 3, 5, 11, 13	75	Push Plates	60&10	Sash Knobs, Wood	70&10
Gate Hinges	60&10	Drawer Pulls, pages 470, 471	65&10	Base Knob, Iron	70, 10, 10
Gate Sockets	60&10	Drawer Pulls, Nos. 0 1/2, 1	65&10	Sash Cord Irons	55
No. 0, Gate Latches	60	Nos. 85, 86	70&10	Axle Pulleys, page 615	60
No. 65, Gate Latches	60	Nos. 87, 88	70&10	No. 6	55
Rhoad's Gate Latches	60&10	Drawer Pulls, page 481	65&10	Nos. 0, 00	45
Top Gate Latches	60&10	Drawer Pulls, Nos. 1616A to M1617A	70&10	Page 617	55
Upright Gate Latches	60&10	Nos. C492E, C392E	75	Nos. 208, 408	55
Gate Latches, Nos. 7, 8 and 9	60&10	Drawer Pulls, page 483	70&10	Nos. 20, 400	50
Barn Door Rollers	60&10	Druggists' Drawer Pulls	70	Page 619	50
New England Barn Door Hangers	60, 10, 10	Label Plates	70	Dumb Walter Pulleys	60
Swirling Barn Door Hangers	60, 10, 10	Drop Handles, page 486	60	Ceiling Pulleys	60
Wood Track Barn Door Hangers	60&10	Drop Handles for Drop Handles	60	Hot House Pulleys	60&10
Barn Door Rollers	60&10	Drop Handles, page 487	70	Upright Pulleys	60&10
Barn Door Stays	60&10	Lifting Handles	60&10	Side Pulleys	60&10
Sliding Door Rail, Nos. 135 and 145	60, 10, 10	No. 2	60&10	Increased Screw Pulleys	60, 10, 10
Wrought Sliding Door Rail, No. 175	60&10	Nos. 4, 1, 8M8	60	Increased Swivel Pulleys	60, 10, 10
Tower Bolts	60&10	Nos. 5, 7, 3	60&10	Clothes Line Pulleys, page 625	60&10
Barrel Bolts, page 318	60&10	Ring Handles	65&10	Clothes Line Pulleys, page 626	60
Barrel Bolts, page 319	70	Drop Handles	65&10	No. 64, Clothes Line Pulleys	60&10
Barrel Bolts, whole page, 320	70	Trunk Handles	60	All other Clothes Line Pulleys	60&10
Nos. T472A, 472A, Barrel Bolts	60, 10, 10	Flush Rings	60, 10, 10	Well Wheels	60&10
Nos. 462A, 462A, Barrel Bolts	60&10	Flush Drawer Handles	55	Brass Side Pulleys	70&10
Brass Barrel Bolts, page 322	60&10	Chest Handles	65&10	Brass Upright Pulleys	60, 10, 10
Brass Barrel Bolts, page 323	70	Flush Chest Handles, Japanned	70	Brass Screw Pulleys	70
Wm City Brass Barrel Bolts	60&10	Flush Chest Handles, Bronzed	70&10	Line Cleats	60&10
No. 304, Neck Bolts	60&10	Flush Trap Door Handles	70	Foot Scrapers	55
No. 378, Neck Bolts	70	Wrought Chest Handles, Nos. 71 to 76	60&10&10	Shelf Brackets, No. 44	60&10
Nos. 303, 304, Neck Bolts (Wrought)	70	Nos. 171 to 176	70&10	Nos. 4, 102, 268	60&10
Nos. 500 1/2, 390, Neck Bolts	60&10	Nos. 1 to 6	60&10	Shelf Brackets: Japanned, Tuscan, Berlin	60&10
Nos. 423, 423	60&10	Nos. 101 to 106	70	Tokio (K294, K295) reduce to same list as Tokio	60&10
Neck Bolts, page 328	70&10	Tub Handles, Nos. 15, 115	60&10	Yeddo (Y264, Y265) reduce to same list as Tokio	60&10
Spring Bolts	70&10	Wrought Tub Handles, Nos. 7, 107	60&10&10	Hand-Rail Brackets	60&10
Square Bolts	70	Closet Hooks	60&10&10	Hand-Rail Plates	60&10
No. 300 Square Bolts	60&10	Harness Hooks	60&10	Hand-Rail Screws	70&10
Floor Plates for Square Bolts	60&10	Store Rack Hooks	60&10	Wire Fence Hooks	60
Staples for Square Bolts	60&10	Baggage or Harness Hooks	60&10	Fence Hook Clasp and Braces	60&10
No. 500, Square Bolts	60	Hotel or School-House Hooks	60	Double-Pointed Tacks	85&10
Square Bolts, Bronzed	70	No. 93	60	In bulk, Blued and Tinned	70
Square Bolts, Bronze Metal	60&10	No. 96	60&10	Double-Pointed Shade Tacks	85
Bottom Bolts, Bronze Metal	70	Coat and Hat Hooks, to screw	60&10	Square Crown Carpet Staples	70&10
Square Cased Bolts: Nos. T1402A, 1402 A, Nos. T1404A, 1404A	70	To drive	60&10	Box or Casket Staples	70&10
Nos. K1402A, Y1402A	70&10	Coat and Hat Hooks: Nos. 13, 113, 5, 106, 25	60&10	Round Wire Round-Crown Staples	70
Nos. 1802A, M1802A	70&10	Nos. 4, 24, 34, 104, 75, 175	60&10	Barbed Blind Staples	70
No. 601, Square Cased Bolts, Nos. 503, 506	60&10	Coat and Hat Hooks, pages 505, 506, 509, 510 to 513	60&10	Barbed Bed-Spring Staples	70&10
Nos. 602, 604, Square Cased Bolts	60&10	517, 518	60&10	Poultry Netting Staples	70&10
Foot Bolts: Nos. T1491A to T1491A	60&10	Coat and Hat Hooks, pages 507, 514 to 516 1/2, 519 to 523	60	Flat Steel Round-Crown Staples	60&10
Nos. 1891A, M1891A, Nos. 595, 596 P	60&10	523	60	Wrought Staples	80&25
Nos. 390, 391, 392 Foot Bolts	70	Screw Hat Hooks	60	Wrought Hooks and Staples	80&25
Chain Bolts, Nos. 380, 381, 382	70	Ceiling Hooks, page 527	60	Hasps and Staples	80&25
Extra Heavy Chain Bolts	70	Ceiling Hooks, page 523	55	Wrought Staples on Plates	80&25
Chain Bolts: Tuscan and Berlin Bronzed, Tokio and Yeddo, Bronze Metal, No. 583, Cast Brass	60&10	Chandelier Hooks	60	Wagon Bow Staples	60&10
Brass Chain Bolts	60&10	Chandelier or Braced Screw Hooks	55	Wagon Stake Irons	60&10
Extra Heavy Chain Bolts	65&10	Chandelier Hooks, No. 410	60&10	Wagon Nails	60
Mortise Door Bolts, page 346	55	No. 418, Screw Hooks	80	Hinge Rivets	60
847	70	No. 419, Screw Hooks	75	Hinge Nails	60
Ship Flush Bolts	60&10	No. 406, Drive Hooks	70	S Hooks	80&25
Cast Brass Flush Bolts	60&10	Wire Drive Hooks	55	D Links	80&25
Flush Bolts	60	Brush or Duster Hooks	70&10	Open Links	80&25
Bronzed Flush Bolts: Tuscan and Berlin	60&10	Coppered Screw Hooks	70&10	Washers, 8 1/2 cents from List	10
Tokio and Yeddo	70	Picture or Mirror Hooks	70&10	Corner Irons	80&25
Bronzed Flush Bolts, page 358	60&10	No. 80, Cup Hooks	70&10	Awl Hooks	80&25
pages 358, 359	60	No. 81, Cup Hooks	80	Sign Hooks	80&25
Nos. C85E, C106E, 106P	60&10	Nos. 82, Cup Hooks	75	Pipe Hooks	80&25
Bronze Metal Flush Bolts	60	Nos. 89, 90 Cup Hooks	70	Leader Hooks	80&25
Extension Flush Bolts	60	No. 65, Hooks without Eyes	70	Meat Hooks	75
Mortise Flush Bolts, Bronzed	75	No. 63, Hooks and Pins	60&10	Ham Hooks	75
Bronze Metal	70	Brass Hooks and Eyes, whole page 641	60&10	Well Wheel Hooks	70
Nos. C1109E, 3108P, L3108P	60&10	Cabin Door Hooks	60	Eye Bolts, p. 667	60
Cupboard Bolts	60&10	Ship Cabin Door Hooks	60	Screw Hooks	60&10
Straight Cupboard Bolts	60&10	No. 100, Safety Gate Hooks	60	Hammock Hooks	70&10
Brass Flat Bolts	60&10	Gate Hooks and Eyes	87 1/2	Trap Door Rings	80&25
Door Buttons	60&10	Gate Hooks without Loose Eyes	87 1/2	Trap Door Rings and Staples	80&25
No. 5 Door Buttons, page 370	60	Cornice Hooks and Eyes	87 1/2	Hitching Rings	70
No. 15 Door Buttons	60	Cornice Hooks without Eyes	87 1/2	Hitching Hooks and Rings	70
Nos. 32, 33, Door Buttons	60&10	Plates for Cornice Hooks	87 1/2	Hitching Post Caps	80&10
Elbow Catches	60&10	Bird-Cage Eyes	87 1/2	Hitching Post Rods	70
Barn Door Elbow Catches	60&10	Stair Rod Eyes	87 1/2		
Cupboard Latches	60	Mosquito Bar Eyes	87 1/2		
Cupboard Catches, Nos. 6310, 6311, 6411	55	Bright Wire Goods	87 1/2		
Cupboard Catches, Nos. 6320, 6325	60	Wire Cup Hooks	87 1/2		
Cupboard Catches, Nos. 8230 to 3453	60&10	Belt Hooks	80		
		Wire S Hooks	60		

Rein Chains.....	70
Breast Chains.....	70
Halter Chains.....	70
Hitching Chains.....	70
Shaw Patent Slide Lock Snaps.....	70
Double Lock Snaps.....	70
German Snaps.....	70
Sargent's Patent Snaps.....	70
Cock Eye Snaps.....	70
Covered Spring Snaps.....	70
Open Spring Snaps.....	70
Cattle Ties, Nos. 5, 1.....	70
Cattle Ties, No. 4.....	70
Cattle Ties, page 683.....	70
Rope Trimmings or Cattle Ties.....	70
Rope Halter Leads.....	70
Rope Horse and Cattle Ties.....	70
Hitching Halters.....	70
Rope Horse and Cattle Ties.....	70
Bull Snaps.....	70
Bull Rings, Nos. 10 to 22.....	70
Bull Rings, No. 25.....	70
Cattle Leaders.....	70
Ox Bow Pins, Nos. 71, 72.....	70
Ox Bow Pins, No. 82.....	70
White Metal Manes.....	70
Ox Balls.....	70
Prize Ox Balls (Bronze Metal).....	70
Carriage Knobs.....	70
Sheep and Cow Bells.....	70
Kentucky Cow Bells.....	70
Western Cow Bells.....	70
Twine Boxes.....	70
Paper Clips.....	70
Paper Weights.....	70
Files.....	70
File Hooks.....	70
Bird Cage Hooks.....	70
No. 37, Match Safes.....	70
No. 60 Match Safes.....	70
Match Safes, pages 704, 705.....	70
Boot Jacks.....	70
Nut Cracks.....	70
Cork Pressers.....	70
No. 1 Garden Trowels.....	70
No. 15 Garden Trowels.....	70
Garden Forks.....	70
Hooks.....	70
Coffee Pot Stands.....	70
Sad Iron Stands.....	70
Ice Axes.....	70
Shoe Hammers.....	70
Shingling Hatchets.....	70
Nail Hammers.....	70
Tack Hammers, excepting No. 16.....	70
No. 16, Tack Hammers.....	70
Tack Hammers, page 714, excepting No. 32.....	70
No. 32, Tack Hammers.....	70
Tack Hammers, page 715.....	70
Carpet Stretchers.....	70
Tack Claws, Nos. 0, 1, 10.....	70
Nos. 30, 31.....	70
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Sargent-Sprague Can Openers.....	70
Can Openers.....	70
Cake Turners.....	70
Paste Jaggers.....	70
Mop Heads.....	70
Perry Sausage Stuffers.....	70
Hale Meat Cutters.....	70
Tobacco Cutters.....	70
Stebbins' Genuine Gates, Nos. 21 to 24.....	70
Stebbins' Genuine Gates, Nos. 41 to 55.....	70
Stebbins' Pattern Gates.....	70
Stebbins' Genuine Self-boring Gates.....	70
Game Traps.....	70
Spring Balances.....	70
Spring Balances, Page 728.....	70
Scale Beams.....	70
Poises—separate.....	70
File Handles.....	70
Chisel Handles.....	70
Screw Driver Handles.....	70
Awl Hafts.....	70
Patent Awl Handles.....	70
Brad Awl Handles.....	70
Handled Brad Awls.....	70
Handled Scratch Awls.....	70
Peg Awls.....	70
Brad Awls.....	70
Sewing Awls.....	70
Awls and Tools, pages 735, 737.....	70
Nos. 60, 61.....	70
No. 62.....	70
Brass Plumb Bobs.....	70
Lead Plumb Bobs.....	70
Japanned Plumb Bobs.....	70
Pocket Wrenches.....	70
Allen's Saw Sets.....	70
Appleton's Washer Cutters.....	70
Saw Screws.....	70
Saw Rods.....	70
Melting Ladles.....	70
Bench Hooks.....	70
Sargent's Iron Planes.....	70
Squares.....	70
Steel Rules.....	70
Domestic Shears.....	70
Domestic Bit Braces.....	70
Nos. 40, 20, Screw Drivers.....	70
No. 1, Screw Drivers.....	70
No. 60, Screw Drivers.....	70
Wrought Nail Claws.....	70
Wrought Nail Grips.....	70
Cotton Hooks.....	70
Box Hooks.....	70
Box Chisels.....	70
Cold Chisels.....	70
No. 40, Carpenter's Pincers.....	70
No. 42, Carpenter's Pincers.....	70
No. 52, Horse Shoeing Pincers.....	70
No. 62.....	70
No. 72.....	70
Roof Nippers.....	70
Blacksmiths' Tongs.....	70
Blacksmiths' Butterflies.....	70
Grindstone Fixtures.....	70
Shaft Extension.....	70
Vises.....	70
Saw Vises.....	70
Nos. 5, 6, Blacksmith's Drills.....	70
No. 10.....	70
Sockets for Square Shank Drills.....	70
No. 40, Iron Bench Screws.....	70
Nos. 50, 55, Bench Screws.....	70
Extra Length Bench Screws.....	70
Clamp Heads.....	70
Door Clamps.....	70
Jack Screws.....	70
Carriage Makers' Clamps.....	70
Cabinet Makers' Clamps.....	70
Stool Pivots.....	70
Plano Stool Screws.....	70
Chair Screws.....	70
Veneer Points.....	70
Table Fasteners.....	70
Table-leaf Supports.....	70
Looking-Glass Plates.....	70
Screws.....	70
Pin Hinges.....	70
Bedstead Fastenings.....	70
Bed Hooks.....	70
Keys.....	70

Plate Casters, Nos. 1 to 27.....	60
Nos. 31 to 37, 41 to 67, 71 to 107.....	60
Philadelphia Casters, Nos. 901 to 927.....	60
Nos. 931 to 937.....	60
Nos. 1021 to 1027.....	60
Nos. 941 to 1027.....	60
French and English Pattern Casters.....	60
English Pattern Casters.....	60
Casters for Iron Bedsteads.....	60
Round Shallow Socket Casters.....	60
Deep Socket Casters.....	60
Plano Forte Casters, All Iron.....	60
Brass Wheel.....	60
Rubber Tire Casters.....	60
Bedstead Casters, Nos. 401 to 426.....	60
Nos. 432 to 437.....	60
Nos. 441 to 442.....	60
Globe Wheel Bed Casters.....	60
Bracket Bed Casters.....	60
Store Truck Casters.....	60
No. 874 Store-Truck Casters.....	60
Rubber Tire Store-Truck Casters.....	60
Cast-Iron Coal Shovels.....	60
Cast-Iron Sifters.....	60
Wrought-Iron Coal Shovels.....	60
Stove-Cover Lifters.....	60
Iron-Head Pokers.....	60
Brass-Head Pokers.....	60
Wood-Handle Pokers.....	60
Coal Tongs.....	60
Bronzed Shovels.....	60
Bronzed Tongs.....	60
Bronzed Pokers.....	60
Bronzed Fire Iron Sets.....	60
Cottage Fire Sets, Nos. 25, 26.....	60
Cottage Fire Sets, Nos. 126, 236.....	60
Cottage Fire Sets, Nos. 20, 22.....	60
Cottage Fire Sets, Nos. 122, 222.....	60
Fire Iron Stands.....	60
Umbrella Stands.....	60
Blower Stands.....	60
Fire Dogs.....	60
Padlocks.....	60
Padlock Keys.....	60

Foreign Markets.

EQUIVALENTS.

	Cents.
Franc, Peseta or Lira.....	19.3
Florin (Netherlands).....	40.2
Florin (Austria).....	35.9
Milreis (Portugal).....	1.08
Milreis (Brazil).....	54.6
Mark (Germany).....	23.8
	Pounds.
Kilogram.....	2.205
Picul.....	134.

WEST INDIES.

PORT OF SPAIN, TRINIDAD, November 23, 1888.—*Asphaltum*.—Our market has been moderately active and steady at \$14.04 per ton boiled, and \$6.84 crude, free on board, inclusive of export duty. There were shipped since Jan. 1, 46,397 tons, against 39,055 last year, and 34,677 in 1886. *Exchange*, \$4.80 @ \$4.86 for 90 days' sight drafts on London.—*E. P. Masson*.

CHILI.

VALPARAISO, October 26, 1888.—*Copper*.—At slightly easier rates, owing to a higher exchange, there were sold during the fortnight altogether 22,068 quintals at \$28.35 @ \$29.10, \$28.50 equaling £76. 12/4, with 27/6 steam freight. Nearly all 1888 shipments have been disposed of. *Nitrate*.—A large business has been done in December and January shipments, sales aggregating 783,000 quintals, 95 % at \$2.80, and 280,000 96 % at \$2.80 @ \$2.97, \$2.85 equaling 9/4. The total export in September amounted to 1,579,597 quintals, and there remained loading on the 1st inst., 2,348,016 quintals. Nitrate shipments during the first 9 months:

	1886.	1887.	1888.
	Quintals.	Quintals.	Quintals.
To North of Europe.....	4,269,416	7,243,336	8,539,507
To the Mediterranean.....	112,712	182,938	103,334
To the United States on the Atlantic.....	1,134,017	1,249,500	2,144,724
To the United States on the Pacific.....	237,369	164,296	113,438
Totals.....	5,753,514	8,840,070	10,901,003

During the fortnight 35,700 tons were chartered for Europe, and 2350 for the United States. *Coal* has been looking up again in view of light shipments this way. Newcastle advanced from 32/ to 37/6. *Exchange* has been tending upward. We quote, 90 days' sight on London, 27 1/2 d.—*Weber & Co.*

EAST INDIES

PENANG, November 13, 1888.—*Tin*.—Receipts during the fortnight reached 12,000 piculs, of which Europeans took 5200, and Chinese 6000, prices meanwhile declining from \$38.10 per picul to \$37.62. From January 1 to November 4, there were shipped to England 118,147 piculs; to the Continent, 338, and to America, 8158. *Exchange*.—Four months' bank, 3 1/2 @ 3/0. —*Schmidt, Kustermann & Co.*

SINGAPORE, November 20, 1888.—*Tin*.—Since our report of the 6th inst. Tin touched \$37.50 per picul, but is now firmer for ready metal at \$38. Supplies are not very large at the moment, but there is every appearance of large arrivals in December and January. Following have been the shipments to America during the first 10 months: This year 47,518 piculs from Singapore and Penang; in 1887, 68,730; in

1886, 59,121; in 1885, 23,863; in 1884, 55,279, and in 1883, 99,164. *Gum Copal*.—There has been a moderate business done at \$12 down to \$9.20, according to quality. *Gum Damar*.—A small lot of inferior Palambang has been taken by Continental buyers at \$20.50 per picul. *Tonnage*.—Is more plentiful, but rates are firmer at 60/ for weight. New York via Canal. —Steamers are filling up in China, and nothing can be engaged at present. Via Cape.—The "Flora P. Spofford" continues her loading. For Boston.—The "Penobscot" loads for charterers' account. *Exchange*.—Six months' credits, 3 1/2. —*Gillfillan, Wood & Co.*

MANILA, December 24, 1888.—*Hemp*.—Quotations are altogether nominal at \$15.15-16 per picul, against \$8.50 in 1887, equaling per ton, cost and freight, £54. 10/ against £30. 10/. There cleared for the United States since last cable 3000 bales, against none last year; since January 1 241,000 bales, against 246,000; and there remain loading for do. 25,000, against 11,000; cleared for England since January 1 334,000 bales, against 225,000; loading, 7000, against none; cleared for all other ports, 68,000, against 46,000; receipts at all ports since last cable, 9000, against 9000; since January 1, 642,000 bales, against 527,000 in 1887, and 395,000 in 1886. *Freight*, \$7.50, against \$5.50. *Exchange*, 3/8, against 3/8.—*Ker & Co., per cable direct to their agent, Mr. Charles Nordhaus, 89 Water street, New York.*

RUSSIA.

ST. PETERSBURG, December 23, 1888.—*Petroleum*.—The authorities of Batoum have refused to sanction Rothschild's scheme to lay pipes through that town to convey Petroleum from the wells directly to the ship's side. Their objection to the plan is that it would do injury to small traders.—*Per cable direct.*

SWEDEN.

STOCKHOLM, December 18, 1888.—*Iron Ore*.—Considerable agitation is going on in Central Sweden against Gellivara Iron Ore, which the owners of other mines in Sweden want to be saddled with a prohibitive export duty, because they are afraid that it will supersede abroad all other Swedish Iron Ore. As the Lulea-Ofoten Railroad Company intend to build blast furnaces and rolling mills for the purpose of utilizing Gellivara and Luossavara Ores on the spot, the mine owners of Central Sweden demand that the erection of such works be simply prohibited, and a bill will be introduced to that effect during the coming session of Parliament, they being afraid that the present make of Swedish Iron will become unsaleable abroad in competition with Lulea. Meanwhile, Fred Krupp, of Essen, has also resolved to import next summer large amounts of Gellivara Ore, the experiments made with the same at Essen having given the most encouraging results.—*Dagbladet.*

SPAIN

BILBAO, December 15, 1888.—*Metals*.—Spanish exportation during the first nine months as under:

	1886.	1887.	1888.
	Tons.	Tons.	Tons.
Calamine.....	21,140	20,698	23,105
Pyrites.....	515,094	594,779	629,600
Iron Ore.....	3,316,242	4,262,415	3,590,475
Pig Iron.....	42,967	89,488	48,980
Precipitate.....	20,607	19,499	21,239
Quicksilver.....	540	1,118	875
Pig Lead.....	82,591	99,168	97,917

Total..... 3,990,181 5,087,165 4,421,191
The falling off in the Iron branch and Quicksilver deserves attention.—*Bilbao Maritimo y Comercial.*

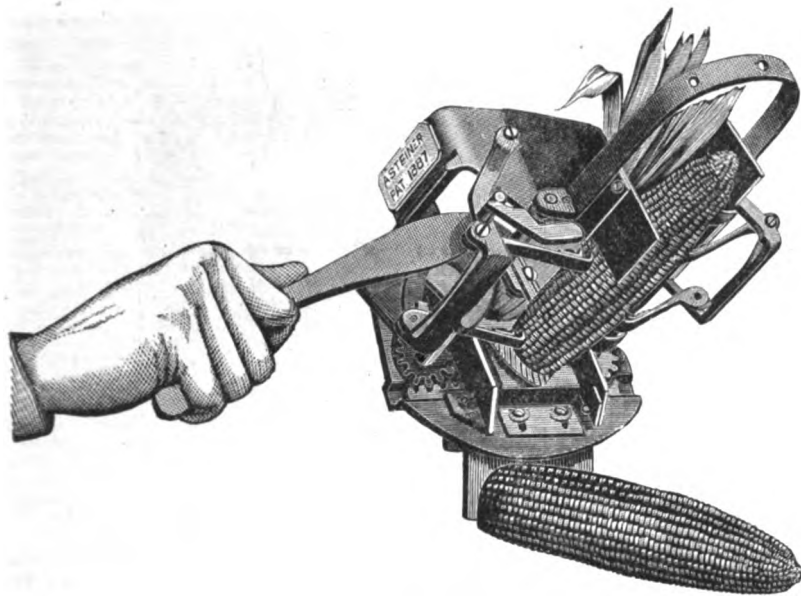
The extensive sheet iron mills of George W. Johnson, at Newcastle, Pa., have been remodeled, and additional ground and building added to it.

A supplement has been issued to the rate sheet of the Queen and Crescent route on pig iron. The principal change is that the rate from Rockwood and Dayton has been made \$5.78 to Atchinson, Kansas City, Leavenworth and St. Joseph, and from Chattanooga, Rising Fawn and the Birmingham district \$5.64 to all the points named.

The Servia, which sailed on Saturday for Europe, carried quite a party of iron and steel makers, among them being C. W. McKinney, general manager, and A. Scranton, superintendent, of the Scranton Steel Company, and Messrs. Gayley and Lauder, of Pittsburgh.

The Champion Corn Husker.

A simple but efficient method of husking corn by machinery is illustrated herewith. This device is the invention of A. Steiner, a practical Illinois farmer, who perfected the machine after many years of experiment, in the hope of avoiding the drudgery of husking corn by hand.

*The Champion Corn Husker.*

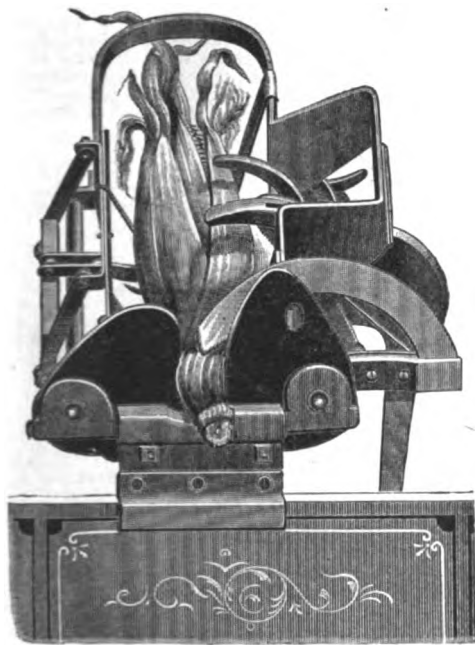
One of the principal claims of the inventor is that the Champion Corn Husker will handle corn either wet or dry, so that its operations are not dependent upon the condition of the weather. The husking can therefore be done in the field, or after the corn has been shocked, or when it has been dumped near the crib, so that this

the face, the handle is raised, the knife moves down and cuts the cob, and at the same time two plungers force the ear down imbedding the teeth of the four fingers in the husk, after which the two arms drop down, the husk is cut from the cob and the four arms separating tear the husk apart and the clean ear of corn drops down. The machine ad-

justs itself to the size of any ear. It is strongly made of steel and malleable iron, is not easily put out of order, and can be operated by a boy. Another feature of the machine is that it saves the husks intact, so that they can be gathered and sold for mercantile uses. It is sold by the Champion Corn Husker Company, 347 Wabash avenue, Chicago.

The Kitchen Jewel.

The accompanying illustration represents this article, which is manufactured by the T. B. Harkins Foundry Company, Bristol, Pa. From the illustration given herewith it will be seen that it is intended to be placed in the stove hole, thus bringing the cooking utensil which is placed in it close to the heat without affecting the fire. Its utility is thus obvious and the manufacturers make the point that it is also a great coal saver, as small cooking utensils can be put in

*Champion Corn Husker for Use in the Field.*

work can be done at odd times or when other work about the farm is not possible. One of the illustrations shows the full machine, while the other represents it bolted to a wagon body for use in the field. It is composed of a three-sided metal frame. Extending across the bottom are four fingers with teeth on them and two arms. On the inside of the front piece is a V-shaped knife standing upright. In operating the machine the ear of corn is laid in from the top, the end of the cob projecting through the slot in

this receptacle, thus making it unnecessary to have a large fire. It is made in four sizes, Nos. 6, 7, 8 and 9.

Minnesota has a board of prison inspectors who have just completed a tour through the States from California to the Atlantic Coast, and will prepare a report. Their account respecting institutions in New York is not in the least flattering. At

Elmira there were 500 men who learn stone cutting and recut the blocks until they are reduced to sand. They also manufacture electrical instruments of brass with great care, only to destroy them, melt the material and begin again. The only prison visited that pays its expenses is at Detroit, which has the public account system.

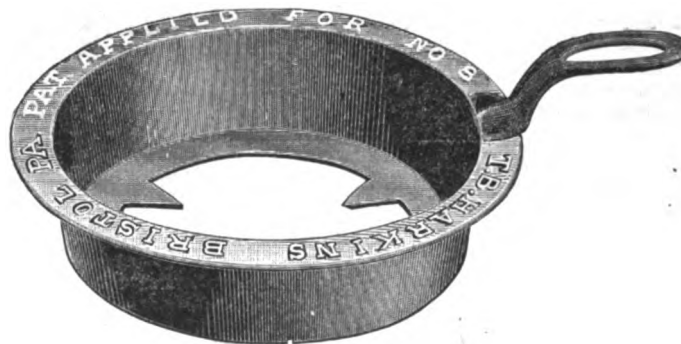
Benedict's Reservoir Mucilage Brush.

Mr. A. L. Benedict, of New Canaan, Conn., is introducing to the trade a novel mucilage brush which will be found very convenient for desk use. It combines the principles of an oil can with a bristle brush, and presents the appearance indicated by the cut shown herewith, reminding one very much of the oilers used in connection with the sewing machines of common use. The end of the tube has been ingeniously fitted with a brush, while inside of the bristles is a tube leading down to the mucilage supply. When the reservoir is inverted and the bottom pressed

*Benedict's Reservoir Mucilage Brush.*

by the thumb the mucilage is forced into the brush, and more or less can be supplied at will. The device has the advantage of keeping the mucilage away from the air, so that it does not become thick by evaporation, nor waste. The brush is self-righting and never tips over; accordingly, the article is always neat, ready and reliable. The reservoir is easily refilled. Mr. Benedict is offering these articles in zinc and brass, and also handsomely nickle-plate, and, we understand, has in contemplation still other styles embodying the same general principles of construction, but more ornamental in character.

Large shipments of firearms and warlike munitions are being made from New York to Hayti for both of the contending fac-

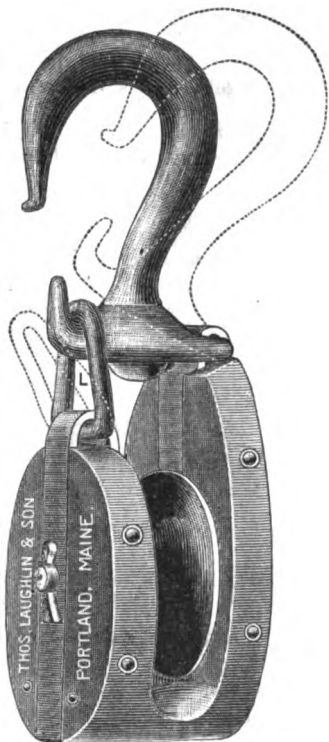
*The Kitchen Jewel.*

tions and the Haytian minister is authority for the statement that \$4,000,000 borrowed in Holland by the President of the Dominican Republic is intended for the purchase of a war steamer for the Northern party.

Cars for the transportation of fruit are made that have wicks running their entire length with tanks beneath holding oil enough to burn for ten days.

Automatic Link Snatch Block.

The accompanying illustration represents a new snatch block, patented December 11, 1888, by Thomas Laughlin & Sons, Portland, Me., by whom it is put on the market. It is intended to obviate the difficulties of the old style link which cannot be opened or closed without turning the hook in one position, which is often inconvenient. In this block the link is kept in position by a hard rubber spring under it, and will instantly return to position when pulled out to unlock the hook. When the hook is unlocked it is only necessary to press it against the link, which instantly locks it, so that it remains locked whether there is a hold on it or not. The



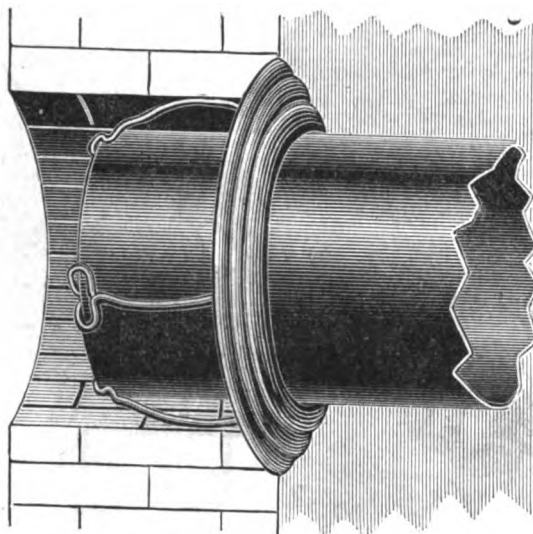
Automatic Link Snatch Block.

simplicity and effectiveness of this arrangement are alluded to and the point is made by the manufacturers that it is impossible to shake the link open, making the block exceedingly secure and satisfactory. The ironwork is referred to as heavy and the sheaves as large and wide in the score as any other make, the quality of the workmanship being also referred to.

Safety Stove-Pipe Holder.

In the cut here shown we present a general view of what is known to the trade as the Safety Stove-Pipe Holder, patented and manufactured by Messrs. Welsh & Kurtis, of Springfield, Ohio. The device consists of a pressed collar, constructed of the best charcoal tin, and is provided with spring fingers attached in such a manner as to expand and grip the interior of a flue hole. In placing the collar in position it is first slid back on the stove pipe until the bent loops or ends of the fingers spring over the end of the pipe, which is set in such a way as to enter the flue far enough to just clear the brickwork, with the mouth of the pipe even with the inside smoke chamber of the chimney. When the fingers have been contracted, the pipe, with holder and collar in position, is inserted in the flue until the collar comes in contact with the wall, when the fingers expand and grip the inner sides of the smoke flue. The fingers are so constructed that they act irrespective of the regularity of the interior surface of the flue, and hold the pipe in either a horizontal or an upright position. The makers state that this device has been indorsed by the fire insurance

companies for the reason that its use prevents the dropping of sparks, ashes or soot upon the floor, and the liability of the pipe falling down is avoided. The pipe is prevented from entering the flue so far that it comes in contact with the back of the chimney, and it also holds the collar firmly in place against the wall, which

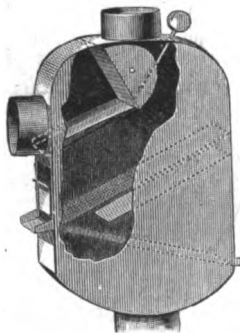


Safety Stove-Pipe Holder.

tends to keep the air from entering the flue between the collar and the chimney. The makers claim for this device that it is easily adjusted in place upon the pipe, that it can be adapted to fit any flue wherever the pipe can be inserted in a flue hole, and that it will hold the pipe in the center of the flue, leaving an air space around the pipe, thus greatly reducing the danger from fire.

Improved Rain-Water Cut-Off.

In the cut shown herewith, we present a view of a rain-water cut-off, a patent for which has recently been granted to W. C. Bayless and J. C. Nichols, of Massy Creek, Jefferson County, Tenn. In the engraving a portion of the side of the cut-off is broken away, exposing the interior, and indicating the general arrangement of parts. The cut-off is claimed to be self-cleaning—that is, the waste water does not pass over the strainers, but finds an outlet above them. The use of reverse strainers makes the device compact, while the construction is simple and durable. Just below the first strainer is a



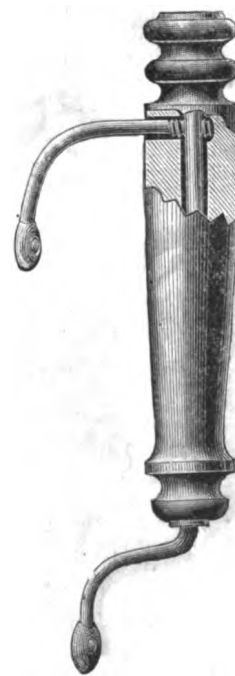
Rain Water Cut-Off.

turn-back which throws the water on to the highest part of the lower strainer, thus utilizing all the straining surface. When the lever shown in the cut is pushed down into the cut-off the water is turned into the cistern, but when the lever is pulled out the water is discharged at the waste spout. The device is well made in all its parts and so arranged as to give very satisfactory results. We understand that the patent covering the main features of construction is in the market.

Patent Wooden Handle for Tea and Coffee Pots.

John Tobin, of Nos. 125-129 New Jersey Railroad avenue, Newark, N. J., has recently introduced to the trade, in connection with his manufactures of tin-

ware, a very serviceable wooden handle, a general view of which is shown in the accompanying illustration. As will be seen from a careful inspection of the cut,



Patent Wooden Handle for Tea and Coffee Pots.

the handle is composed of three parts, two being of metal and one of wood. Holes in the wooden piece allow the two parts composed of metal to be inserted and screwed together, as indicated at the point where the handle is broken away to show the construction. By this arrangement a handle is provided which is at once simple and durable. The shorter rod screws into the head of the longer one in such a way as to make it impossible, after the handle is attached to the pot, to get out of order or come apart. The strain upon the wooden portion is not confined to one end only, rendering the wood liable to fracture, but is distributed along its entire length. Mr. Tobin is employing these handles upon fluted teapots with spun copper bottom, and upon planished round tea and coffee pots with very satisfactory results.

CURRENT HARDWARE PRICES.

JANUARY 2, 1889.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers, at the figures named.

Ammunition.—

Caps, Percussion, \$1000—	
Hicks & Goldmark's	
F. L. Waterproof, 1-10's	50¢
E. L. Trimmer Edge, 1-10's	65¢
E. B. Grad. Edge, Cent. Fire	25¢
1-10's, 70¢	74¢
Double Waterproof, 1-10's	\$1.40
Musket Waterproof, 1-10's	50¢
O. D.	25¢
S. B.	30¢

Union Metallic Cartridge Co.	
F. C. Trimmer	50¢
F. L. Ground	25¢
Cent. Fire Ground	70¢
Dbl. Waterproof	\$1.40
Dbl. Waterproof, in 1-10's	\$1.40
S. B. Genuine Imp.orted	45¢
Eley's E. B.	54¢
Eley's D Waterproof, Central Fire	\$1.60

Cartridges.	
Rim Fire Cartridges	50¢
Rim Fire Military	15¢
Cent. Fire Pistol and Rifle	50¢
Cent. Fire, Military and Sporting	15¢

Blank Cartridges, except 22 and 32 cal., additional 10% on above discounts.	
Blank Cartridges, 22 cal.	\$1.75, dis 2%
Blank Cartridges, 32 cal.	\$3.50, dis 2%
Primed Shells and Bullets	15¢
R. B. Caps, Round Ball	\$1.75, dis 2%
R. B. Caps, Con. Ball, Swgd.	\$2.00, dis 2%
Primers	
Berdan Primers	\$1.00, dis 2%
B. L. Caps (for Sturtevant Shells)	\$1.00, dis 2%
All other Primers	\$1.20, dis 2%

Shells—	
First quality, 4, 8, 10 and 12 gauge	25¢
First quality, 14, 16 and 20 gauge	30¢
Star, Club, Rival and Climax brands, 10 and 12 gauge	30¢
Club, Rival and Climax brands, 14, 16 and 20 gauge	30¢
Setbold's Comb. Shot Shells	15¢
Brass Shot Shells, 1st quality	60¢
Brass Shot Shells, Club, Rival, Climax	65¢

I. X. L. 10 and 12 gauge	40¢
"Special," 10 and 12 gauge	30¢
"Special," 10 and 12 gauge	40¢
Forster's Pat.	\$3.25

Shells Loaded—	
List No. 19, 1887	20¢

U. M. C. & W. R. A.—B. F., 11 up.	\$2.00
U. M. C. & W. R. A.—B. E., 9¢10.	2.30
U. M. C. & W. R. A.—B. E., 7¢2.	2.90
U. M. C. & W. R. A.—P. E., 11 up.	3.10
U. M. C. & W. R. A.—P. E., 9¢10.	4.00
U. M. C. & W. R. A.—P. E., 7¢2.	4.80
Eley's B. E., 11 up.	\$1.75
Eley's P. E., 11¢50.	2.80

Anvils.—	
Eagle Anvils	10¢, dis 20¢
Peter Wright's	9¢
Armstrong's Mouse Hole	11¢
Armstrong's Mouse Hole, Extra	11¢
Trenton	9¢
Wilkinson's	9¢
J. & Biley Carr, Pat. Solid	11¢

Anvil Vise and Drill—	
Millers Falls Co.	\$18.00, dis 20%
Cheney Anvil and Vise	25%
Allen Combined Anvil and Vise	40¢
Moore & Barnes Mfg. Co.	35%

Apple Parers—	
Advance	5¢ doz \$4.75
Antrim Combination	5¢ doz 5.25
Baldwin	5¢ doz 5.25
Champion	5¢ doz 7.25
Eureka, 1888	each 17.00
Family Bay State	5¢ doz 12.00
Gem	5¢ doz 5.25
Gold Medal	5¢ doz 4.00
Hudson's New '88	5¢ doz 3.75
Ideal	5¢ doz 3.00
Improve '7 Bay State	5¢ doz 6.00
Little Star	5¢ doz 13.50
Monarch	5¢ doz 5.50
New Lightning	5¢ doz 4.00
Orion	5¢ doz 4.00
Penn	5¢ doz 4.00
Perfection	5¢ doz 4.00
Pomona	5¢ doz 6.00
Reckling Table	5¢ doz 4.50
Turntable	5¢ doz 4.50
Victor	5¢ doz 4.50
Waverly	5¢ doz 4.50
White Mountain	5¢ doz 4.50
76	5¢ doz 4.50
78	5¢ doz 6.50

Augers and Bits—	
Douglas Mfg. Co.	70%
Wm. A. Ives & Co.	
Hampshireville Mfg. Co.	
French, Swift & Co. (F. H. Beecher)	
Cook's, Douglas Mfg. Co.	55%
Cook's, N. H. Copper Co.	50¢10¢50¢10¢55%
Ives' Circular Lip	80%
Patent Solid Head	30%
C. E. Jennings & Co., No. 10, extension	40%
C. E. Jennings & Co., No. 30	60%
C. E. Jennings & Co., Auger Bits, 1/2 set, 2 1/4 quarters, No. 5, 35; No. 30, 43, dis 20%	
Lewis' Patent Single Twist	45%
Jennings' Augers and Bits	60%
Imitation Jennings' Bits	60%
Fug's Black	20%
Car Bits	50¢10¢60%
L'Hommedieu Car Bits	15¢10%
Forstner Pat. Auger Bits	10%

Hollow Augers—	
Ives' No. 4, 1/2 doz \$48, dis 25¢10¢	
French, Swift & Co.	25¢10¢
Douglass	10¢25%
Bonney's Adjustable, 1/2 doz \$48, dis 40¢10%	
Stearns	20¢10%
Ives' Expansive, each \$4.50, dis 50¢10%	
Universal Expansive, each \$4.50, dis 20%	
Wood's	25¢25¢10%

Expansive Bits—	
Clarks' small, 1/8; large, 3/16	dis 35¢35¢5%
Ives' No. 4, 1/2 doz \$40	dis 35¢40%
Swan's	40%
Stearns, No. 1, 20; No. 2, 22	dis 35%
Stearns' No. 2, 24	dis 20%

Gimlet Bits—	
Common	gross \$2.75 @ \$3.25
Diamond	gross \$1.10; dis 25¢10%
" Bee	25¢25%
Double Cut, Sheppardson's	40¢45¢5%
Double Cut, Ct. Valley Mfg. Co.	30¢40%
Double Cut, Hartwell's, 1/2 gro.	\$5.25
Double Cut, Douglass	40¢10%
Double Cut, Ives	60¢60¢5%

Bit Stock Drills—	
Morse Twist Drills	50¢10¢5%
Standard	50¢10¢5%
Cleveland	50¢10¢5%
Syracuse, for metal	50¢10¢5%
Syracuse, for wood (wood list)	30¢30¢5%
Williams' or Holt's, for metal	50¢10¢10%
Williams' or Holt's, for wood	40¢10%
Ship Augers and Bits—	
L'Hommedieu's	15¢10¢15¢10¢5%
Watrous'	15¢10¢15¢10¢10%
Snell's	15¢10¢15¢10¢5%
Snell's Ship Auger Pat'n Car Bits	15¢10¢15¢10¢5%

Awl Hafts—	
Sewing, Brass Ferrule	\$3.50 1/2 gr, dis 45¢10%
Pat. Sewing, Short	\$1.00 1/2 doz, dis 40¢10%
Pat. Sewing, Long	\$1.20 1/2 doz, net
Pat. Peg, Plain Top	\$1.00 1/2 doz, dis 45¢10%
Pat. Peg, Leather Top	\$1.20 1/2 gr, dis 45¢10%

Awls, Brad Sets, &c—	
Awls, Sewing, Common	1/2 gr \$1.70, dis 35%
Awls, Shouldered Peg	1/2 gr \$2.40, dis 35%
Awls, Pat. Peg	1/2 gr 63¢, dis 40¢40¢10%
Awls, Shouldered Brad	2, 70 1/2 gr, dis 35%
Awls, Handled Brad	\$7.50 1/2 gr, dis 45%
Awls, Handled Scratch	\$7.50 1/2 gr, dis 35¢10%
Awls, Socket Scratch	\$1.50 1/2 doz, dis 25¢30%

Awl and Tool Sets—	
Aiken's Sets, Awls and Tools, No. 20, 1/2 doz \$10.00, dis 55¢10%	
Fraser's Adj. Tool Hds., Nos. 1, 12; 2, 18; 3, 12; 4, 8; dis 25¢25¢10%	
Miller's Falls Adj. Tool Hds., No. 1, 12; 2, 18; dis 25%	
Henry's Combination Hatt.	1/2 doz \$5
Brad Sets, No. 42, \$10.50; No. 43, \$12.50, dis 70¢10¢5%	
Brad Sets, Stanley's Excelsior, No. 1	\$7.50, dis 30¢10%
Brad Sets, Stanley's Excelsior, No. 2	\$4.00, dis 30¢10%
Brad Sets, Stanley's Excelsior, No. 3	\$5.50, dis 30¢10%

Axes—	
Makers' and Special Brands—	
First quality	1/2 doz \$6.00 @ \$6.50
Others	1/2 doz \$5.50 @ \$5.75
Axe Grease—	
Fraser's, in bulk	Keg 1/2 4¢, Pail 1/2 5¢
Fraser's, in boxes	1/2 gr \$9.50
Dixon's Everlasting, in box	\$1.20 2 1/2 doz \$2.00
Dixon's Everlasting, 10-lb pails, ea.	\$5¢
Lower grades, special brands	1/2 gr \$5.50 @ \$7.00

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Bag Holders.	
Sprengle's Pat.	1/2 doz \$18, dis 60%
Balances—	
Spring Balances	50%
Common 24-lb	1/2 doz \$1.50, dis 50%
Chaillon's Spring Balances	50%
Chaillon's Circular Spring Balances	60%

Bells—	
Hand—	
Light Brass	70¢10%
Extra Heavy	60¢10%
White Metal	60¢10%
Silver Chime	33¢10%
Globe (Cone's Patent)	25¢10¢35%
Door—	
Gong, Abbe's	33¢45¢10%
Gong, Yankee	45¢10%
Gong, Barton's	40¢10¢50%
Crank, Taylor's	25¢10%
Crank, Brooks	50¢10¢25%
Crank, Cone's	10%

Crank, Connel's	20¢10%
Lever, Sargent's	60¢10%
Lever, Taylor's Bronzed or Plated	net
Lever, Taylor's Japanned	25¢10%
Lever, R. E. M. Co.'s	50¢10¢25%
Full, Brooks	50¢10¢25%
Full, Western	25¢10%

Common Wrought—	
Western, Sargent's list	20¢10%
Kentucky, "Star"	20¢10%
Kentucky, Sargent's list	70¢10%
Dodge, Genuine Kentucky	70¢70¢10%
Texas Star	50¢10¢50¢10¢5%
Call	40¢40¢5%
Farm Bells	1/2 3¢ @ 3 1/4¢
Steel Alloy Church and School Bells	40%

Bellows—	
Blacksmiths	50¢10¢50¢00%
Molders	40¢40¢10%
Hand Bellows	40¢10¢50%

Belting, Rubber—	
Common Standard	70¢10%
Standard	70¢70¢5%
Extra	60¢50¢60¢10%
N. Y. B. & P. Co., Standard	60¢5%
N. Y. B. & P. Co., Extra Standard	50¢10%

Bench Stops—	
Morrill's	1/2 doz \$9, dis 50%
Hotchkiss's	1/2 doz \$5, dis 10¢10¢10%
Weston's, 1/2 doz No. 1, \$10; No. 2, \$9	dis 25¢10¢5%
McGill's	1/2 doz \$3, dis 10%

Bits—	
Auger, Gimlet, Bit Stock, Drills, &c., see Augers and Bits.	

Bit Holders—	
Extension, Barber's	1/2 doz \$15.00, dis 40¢40¢10%
Extension, Ives	1/2 doz \$20.00, dis 40¢40¢10%
Diagonal	1/2 doz \$24.00, dis 40%
Angular	1/2 doz \$24.00, dis 40¢5%

Blind Adjusters—	
Domestic	1/2 doz \$3.00, dis 33¢45%
Excelsior	1/2 doz \$10.00, dis 50¢10¢5%
Washburn's Self-Locking	20¢20¢10%

Blind Fasteners—	
Mackrell's, 1/2 doz pairs, \$1.00, dis 20¢	
Van Sand's Screw Pattern	\$15.00 1/2 gr, dis 60¢10%
Van Sand's Old Pattern	\$15.00 1/2 gr, dis 55¢10%
Washburn's Old Pattern	\$9.00 1/2 gr, net
Merriman's	new list, net
Austin & Eddy No. 2008	\$9.00 1/2 gr, net
Security Gravity	\$9.00 1/2 gr, net

Blind Staples—	
Barbed, 1/2 in. and larger	1/2 7 1/4¢ @ 8¢ net
Barbed, 3/4 in.	1/2 8 1/4¢ @ 9¢ net

Blocks—	
Cleveland Block Co., Mal. Iron	50%
Novelty Tackle Blocks, Mal. Iron	50%

Bolts—	
Door and Shutter—	
Cast Iron Barrel, Square, &c.	70¢70¢10%
Cast Iron Shutter Bolts	70¢70¢10%
Cast Iron Chain (Sargent's list)	65¢10%
Ives' Patent Door Bolts	60%
Wrought Barrel	70¢70¢10%
Wrt Shutter, all iron, Stanley's	60¢10%
Wrt Shutter, Brass Knob	40¢10%
Wrt Shutter, Sargent's list	60¢10%
Wrt Sunk Flush, Sargent's list	55¢10%
Wrt Sunk Flush, Stanley's list	50¢10%
Wrt B.K. Flush, Com'n	55¢10%

Carriage—	
Com. list June 10, '84	75¢2 1/4¢ @ 2 1/2¢
Genuine Eagle, list Oct. '84	75¢10%
Phila. pattern, list Oct. '84	75¢10%
R.B. & W., old list	70%

Tire—	
Common, list Feb. 28, '83	70%
P.C.B. & N. Co., Empire, list Feb. 28, '83	70%
P.C.B. & N. Co., Phila., list Oct. '84	82¢45%
P.C.B. & N. Co., Keystone, Philadel., list Oct. '84	80%
P.C.B. & N. Co., Norway, Philadel., list Oct. '84	75%
Am. S. Co., Norway, Phil., list Oct. 16, '84	75¢10%
Am. S. Co., Eagle, Phil., list Oct. 16, '84	80%
Am. S. Co., Philadel., list Oct. 16, '84	82¢45%
Am. S. Co., Bay State, list Feb. 28, '83	70%
R.B. & W., Philadel., list Oct. 16, '84	82%
R. & E. Mfg. Co.	70%

Stove and Plow—	
Stove	62¢45%
Plow	60¢5%
Am. S. Co. Stove, Annealed	62¢45%
R. B. & W., Plow	62¢45%
R. & E. Mfg. Co., Stove	62¢45%
Machine, according to size	75¢10¢80%
Bolt Ends, according to size	75¢10¢80%

Borax—	
Without	1/2 9¢ @ 10¢45%

Boring Machines—	
Without	
Augers, Upright, Angular, Dis.	
Douglas	\$5.50 \$8.75 50%
Snell's, Rice's Pat.	5.50 6.75 40¢10¢10%
Jennings	5.50 6.75 45¢45¢10%
Other Machines	2.35 2.75 net
Phillips' Patent	7.00 7.50 net
With Augers	

Bow Pins—	
Humason, Beckley & Co.'s	60¢10%
Sargent & Co.'s	\$17 and \$18, dis 60¢10%
Peck, Stow & W. Co.	50¢10¢50¢10¢5%

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Cards—

Horse & Curry.....10&10&10&10
 Cotton.....New list, Aug. 1888,
 10&10&10&10
 Wool.....New list, Aug. 1888,
 10&10&10&10

Carpet Stretchers—

Cast Steel, Polished.....\$ doz \$2.25
 Cast Iron, Steel Points.....\$ doz \$0.80
 Sockets.....\$ doz \$1.75
 Ballard's.....\$ doz \$2&2&10&10

Carpet Sweepers—

Bissell No. 5.....\$ doz \$17.00
 Bissell No. 7 New Drop Pan.....\$ doz \$19.00
 Bissell, Grand.....\$ doz \$38.00
 Grand Rapids.....\$ doz \$24.00
 Crown Jewel, No. 1, \$18.00; No. 2,
 \$19.00; No. 3, \$20.00
 Magic.....\$ doz \$15.00
 Jewel.....\$ doz \$17.00
 Improved Parlor Queen, Nickle-
 plated.....\$ doz \$27.00
 Improved Parlor Queen, Japan-
 nized.....\$ doz \$24.00
 Excelsior.....\$ doz \$22.00
 Garland.....\$ doz \$18.00
 Parlor Queen.....\$ doz \$24.00
 Housewife's Delight.....\$ doz \$15.00
 Queen.....\$ doz \$18.00
 Queen, with band.....\$ doz \$18.00
 King.....\$ doz \$30.00
 Weed, Improved.....\$ doz \$18.00
 Hub.....\$ doz \$18.00
 Cog-Wheel.....\$ doz \$22.00
 Conqueror.....\$ doz \$22.00
 Easy.....\$ doz \$22.00
 Monarch.....\$ doz \$21.00
 Goshen.....\$ doz \$21.00
 Advance.....\$ doz \$18.00
 Ladies' Friend, No. 1, \$15.00;
 No. 2.....\$ doz \$16.00
 American.....\$ doz \$15.00
 Grand Republic.....\$ doz \$35.00

Cartridges—

See Ammunition.

Casters—

Bed.....New list:
 Plate.....Brass.....50&55&55
 Shallow Socket.....Others.....60&60&55
 Deep Socket.....40&10
 Yale Casters, list May, 1884.....30&10&40
 Yale, Gem.....00&60&55
 Martin's Patent (Phoenix).....45&10&50
 Payson's Anti-friction.....60&60&10
 "Giant" Truck Casters.....10&10&5
 Stationary Truck Casters.....45&10

Cattle Leaders—

Humason, Beckley & Co.'s.....70%
 Sargent's.....60%&10%
 Hotchkiss.....30%
 Peck, Stow & W. Co.....50&10

Chain—

Trace, 6 1/2-10-2, exact, \$ pair, \$1.03
 50&10&50&10&55
 Trace, 6 1/2-10-3, exact, \$ pair \$2
 50&10&50&10&55
 Trace, 7-10-2, exact, \$ pair \$1.11
 50&10&50&10&55
 NOTE.—Traces, "Regular" sizes, 3¢ net
 pair less than exact.
 Log, Fifth, Stretcher, and other fancy
 Chains, list Nov. 1, 1884

American Coll., list Nov. 1, 1884
 50&10&50&10&55
 American Coll., 3-16 1/2 5-16 3/4
 In cask lots.....\$8.75 6.25 5.00 4.50
 American Coll., 7-16 3/4 5-16 3/4
 In cask lots.....\$1.40 4.00 3.75 3.50
 Less than cask lots, add 1/4¢ per lb.
 German Coll., list of June 20, 1887
 50&10&50&10&55
 German Halter Chain, list of June 20,
 1887.....50&10&50&10&55
 Covert Halter, Hitching and Breast
 50&25
 Covert Traces.....35&25
 Onelda Halter Chain.....00&60&55
 Galvanized Pump Chain.....\$5.50&60
 Jack Chain, Iron.....75&75&55
 Jack Chain, Brass.....70&70&55

Chalk—

White.....\$ gr 50¢
 Red.....\$ gr 70¢
 Blue.....\$ gr 85¢
 White Crayons.....\$ gr 12¢@12 1/2¢, dis 10%

Chalk Lines—

See Lines.

Chisels—

Socket Framing and Firmer,
 P. S. & W.....20&25
 New Haven and Middle-
 sex.....75&50&75&10%
 Mix.....75&50&75&10%
 Ohio Tool Co.....30%
 Buck Bros.....00&10&60&10&55
 L. & J. J. White.....30&30&55
 Witherby & Douglass.....75&50&55
 Tanged Firmers.....40&10%
 Tanged Firmers, Butchers.....\$1.75&50.00
 Tanged Firmers, Spear & Jackson's.....\$5 to 2
 Tanged Firmers, Buck Bros.....30%
 Cold Chisels, \$ b.....16&19¢

Chucks—

Beach Pat.....each, \$8.00, dis 20%
 Morse's Adjustable.....each, \$7.00, dis 20%
 Danbury.....each, \$6.00, dis 30&30&55
 Syracuse, Balz Pat.....25%

Clamps—

Providence Tool Co.'s Wrought Iron.....25%
 Adjustable, Gray's.....30%
 Adjustable, Lambert's.....20%
 Adjustable, Snow's.....40&55
 Adjustable, Hammers.....15%
 Adjustable, Stearns.....20&10%
 Stearns' Adjustable Cabinet and Cor-
 ner.....20&10%
 Cabinet, Sargent's.....60&40%
 Carriage Makers' Sargent's.....70&10%
 Eberhard Mfg. Co.....40&50&40&10&55
 Warner's.....40&10&40&10&55
 Saw Clamps, see Vises.

Clips—

Norway, Axle, 1/4 & 5-16.....55&55
 Second grade Norway Axle, 1/4 & 5-16
 55&55
 Superior Axle Clips.....60%&50&60%&55

Norway Spring Bar Clips, 5-16.....60&55
 Wrought-Iron Felloe Clips.....\$ b, 6 1/2¢
 Steel Felloe Clips.....\$ b, 6 1/2¢
 Baker Axle Clips.....25%

Cockeyes—

50%

Cocks, Brass.

Hardware list.....40. & 10&25

Coffee Mills—

Box and Side, list revised Jan. 1, 1888,
 50&25

American, Enterprise Mfg. Co. 20&10&30%
 The "Swift," Lane Bros.....20&10%

Compasses, Dividers, &c—

Compasses, Calipers, Dividers, 70&70&10%
 Bemis & Call Co.'s Dividers.....60&55
 Bemis & Call Co.'s Compasses & Cal-
 pers.....50&55
 Bemis & Call Co.'s Wing & Inside or
 Outside.....50&55
 Bemis & Call Co.'s Double.....60%
 Bemis & Call Co.'s (Call's Pat. Inside).....60%
 Excelsior.....20&55
 J. Stevens & Co.'s Calipers and Dividers.....25&10%
 Starrett's Spring Calipers and Dividers.....25&10%
 Starrett's Lock Calipers and Dividers.....25&10%
 Starrett's Combination Dividers.....25&10%

Coopers' Tools—

Bradley's.....20%
 Barton's.....20&20&55
 L. & J. J. White.....20%
 Albertson Mfg. Co.....25%
 Beatty's.....40&40&55
 Sandusky Tool Co.....30&30&55

Corkscrews—

Humason & Beckley Mfg. Co. 40&40&10%
 Clouth's Pat.....33&33&55
 Howe Bros & Hulbert.....35%

Corn Knives and Cutters—

Bradley's.....10%
 Wadsworth's.....25%

Cradles—

Grain.....50&25

Crow Bars—

Cast Steel.....\$ b 4¢
 Iron, Steel Points.....\$ b 3 1/2¢

Curry Combs—

Fitch's.....50&10&50&10&10%
 Rubber.....per doz \$10.00, dis 20%
 Perfect.....50%

Curtain Pins—

Silvered Glass.....net
 White Enamel.....net

Cutlery—

Beaver Falls & Booth's.....33%
 Wootenholme.....\$7.75 to 2

Dampers, &c—

Dampers, Buffalo.....50%
 Buffalo Damper Clips.....50%
 Crown Damper.....40%
 Excelsior.....40&10%

Dividers—

See Compasses.

Dog Collars—

Embossed, Gift, Pope & Steven's list.....30&10%
 Leather, Pope & Steven's list.....40%
 Brass, Pope & Steven's list.....40%

Door Springs—

Torrey's Rod, regular size.....\$ doz \$1.30
 Gray's.....\$ gr, \$20.00, dis 20%
 Bee Rod.....\$ gr, \$20.00, dis 20%
 Warner's No. 1, \$ doz, \$2.50; No. 2,
 \$3.30; dis 40&10&50%
 Gem (Coll), list April 19, 1880.....10%
 Star (Coll), list April 19, 1880.....20%
 Victor (Coll).....00&60&10%
 Champion (Coll).....60&10&60&10%
 Philadelphia.....5 in., \$5.00; 8 in., \$7.75;
 dis 35%
 Cowell's.....No. 1, \$ doz, \$18.00; No. 2,
 \$15.00; dis 50%
 Rubber, complete.....\$ doz, \$4.50; dis
 55&10%
 Hercules.....50%
 Shaw Door Check and Spring.....25&30&35%

Drawing Knives—

P. S. & W.....75&50
 Mix.....75&50
 New Haven and Middlesex.....75&10%
 Merrill.....00&10&10%
 Witherby & Douglass.....75&50&55
 Watrous.....15&10&25%
 L. & J. J. White.....20&55
 Bradley's.....35%
 Adjustable Handle.....25&33%
 Wilkinson's Folding.....25&25&55

Drills and Drill Stocks—

Blacksmiths'.....each \$1.75
 Blacksmiths' Self-Feeding.....each \$7.50,
 dis 20%
 Breast, P. S. & W.....40&10%
 Breast, Wilson's.....30&55
 Breast, Millers Falls.....each \$3.00, dis 25%
 Breast, Bartholomew's.....each \$2.50, dis
 25&10&40%
 Ratchet, Merrill's.....20&20&55
 Ratchet, Ingersoll's.....20&20&55
 Ratchet, Parker's.....20&20&55
 Ratchet, Whitney's.....20&10%
 Ratchet, Weston's.....20&25%
 Ratchet, Moore's Triple Action.....25&30%
 Whitney's Hand Drill, Plain, \$11.00,
 Adjustable, \$12.00.....dis 20&10%
 Wilson's Drill Stocks.....10%
 Automatic Boring Tools.....each \$1.75&
 \$1.85

Twist Drills—

Morse.....50&10&55
 Standard.....50&10&55
 Syracuse.....50&10&55
 Cleveland.....50&10&55
 Williams.....50&10&55

Drill Bits—

See Augers and Bits.

Drill Chucks—

See Chucks.

Dripping Pans—

Small sizes.....\$ b 6 1/2¢
 Large sizes.....\$ b 6 1/2¢

Egg Beaters.

Dover.....\$ doz \$2.00
 National.....\$ doz \$4.50, dis 33 1/3%
 Family (T. & S. Mfg. Co.), \$ gro \$17.00@
 \$18.00
 Kingston (Standard Co.).....\$ gro \$6.50
 Acme (Standard Co.).....\$ gro \$6.00
 Duplex (Standard Co.).....\$ gro \$15.00
 Rival (Standard Co.).....\$ gro \$12.00
 Triumph (T. & S. Mfg. Co.), \$ gro \$10.50

Advance, No. 1.....\$ gro \$11.50
 Advance, No. 2.....\$ gro \$10.50
 Bryant's.....\$ gro \$10.00
 Ayres' Spiral.....\$ gro \$5.00
 Double (Hamblin & Russell Mfg. Co.), \$
 gro \$16.20
 Easy (Hamblin & Russell Mfg. Co.), \$
 gro \$14.00
 Triple (Hamblin & Russell Mfg. Co.), \$
 gro \$16.20
 Spiral (Hamblin & Russell Mfg. Co.), \$
 gro \$4.50
 Paine, Diehl & Co.'s.....\$ gro \$24.00

Egg Poachers—

Buffalo Steam Egg Poachers, \$ doz, No.
 1, \$6.00; No. 2, \$9.00.....dis 25%

Electric Bell Sets—

Wollensak's.....20%
 Bigelow & Dowse.....20%

Emery—

No. 4 to No. 54 to Flour, CF
 48 gr. 150 gr. F. F.
 Kegs, \$ b.....4 1/2¢ 5 1/2¢ 2 1/2¢
 1/2 kegs, \$ b.....4 1/2¢ 5 1/2¢ 2 1/2¢
 1/4 kegs, \$ b.....4 1/2¢ 5 1/2¢ 2 1/2¢
 10-cans, 10.....6 1/2¢ 5 1/2¢ 5 1/2¢
 10-cans, less
 than 10.....10 1/2¢ 10 1/2¢ 7 1/2¢

Enameled and Tinned Ware—

See Hollow Ware.

Escutcheon Pins—

Iron, list Nov. 11, 1885.....50&10&50&10&55
 Brass.....60&60&55

Escutcheons.

Door Lock.....Same dis as Door Locks.
 Brass Thread.....00&60&10%
 Wood.....25%

Faucets—

Fenn's.....40%
 Bohren's Pat. Rubber Ball.....40%
 Fenn's Cork Stops.....33 1/3%
 Star.....60%
 Frary's Pat. Petroleum.....40&5&25%
 Western Key.....50&10%
 Anchor Lock.....45%
 Metallic Key, Leather Lined.....60&10%
 Cork Lined.....70&5&70&10%
 Burnside's Red Cedar.....50%
 Burnside's Red Cedar, bbl lots.....50&10%
 John Sommers.....40%
 Peerless Best Block Tin Key.....40%
 LXL, list quality, Cork Lined.....50%
 Diamond Lock.....50%
 Perfection, Fla. Red Cedar.....50%
 Goodenough Cedar.....50%
 Boss Metallic Key.....50%
 Reliable Cork Lined.....60%
 Western Pattern Cork Lined.....50%
 Self-Measuring Enterprise, \$ doz \$50.00,
 dis 20&10%
 Self-Measuring, Lane's, \$ doz \$36.00,
 dis 25&10%
 Self-Measuring, Victor, \$ doz \$36.00,
 dis 25&10%

Felloe Plates—

Derby and Cincinnati.....45&55

Fish Wheels—

See Files.

Files—

Domestic.....
 Nicholson Files, Rasps, &c.....60&50&60&10%
 Nicholson (X. F.) Files.....25%
 Nicholson's Royal Files (Second).....25%
 75% (extra prices on certain sizes)
 Other makers, best brands
 Fair brands.....60&50&60&10&55
 Second quality.....70&50&75%
 Heller's Horse Rasps.....50&7 1/2&50&10%
 McCaffrey's Horse Rasps.....50&10%

Fluting Machines—

Knox, 4 1/2-inch Rolls.....\$3.25 each 35%
 Knox, 6-inch Rolls.....\$3.00 each 35%
 Eagle, 3 1/2-inch Roll.....\$2.15, dis 35%
 Eagle, 5 1/2-inch Roll.....\$2.85, dis 35%
 Crown, 4 1/2 in., \$3.50; 6 in., \$4.00; 8 in.,
 \$6.50 each.....35%
 Crown Jewel, 6 in.....\$3.50 each, 35%
 American, 5 in., \$3.00; 6 in., \$3.40; 7 in.,
 \$1.50 each.....dis 35%
 Domestic Fluter.....\$1.50 each net
 Geneva Hand Fluter, White Metal.....\$
 doz \$12, dis 25%
 Crown Hand Fluter, No. 1, \$15.00; 2,
 \$12.50; 3, \$10.00.....dis 30%
 Shepard Hand Fluter, No. 85.....\$ doz
 \$15.30.....dis 40%
 Shepard Hand Fluter, No. 110.....\$ doz
 \$8.00.....dis 40%
 Shepard Hand Fluter, No. 95.....\$ doz
 \$8.00.....dis 40%
 Clark's Hand Fluter.....\$ doz \$15.00, dis 35%
 Combined Fluter and Sad Iron.....\$
 doz \$15.00, dis 30%
 Buffalo.....\$ doz \$10.00, dis 10%

Fluting Scissors—

45%

Fodder Squeezers—

Blair's.....\$ doz \$2.00
 Blair's "Climax".....\$ doz \$1.25

Forks—

Hay, Manure, &c., Asso. List.....65%
 Hay, Manure, &c., Phila. List.....60&60&55
 Plated, see Spoons.

Freezers, Ice Cream—

Buffalo Champion.....60&10&55
 Shepard's Lightning.....65%
 White Mountain.....60%

Fruit and Jelly Presses—

Enterprise Mfg. Co.....20&10&30%
 Bendis.....\$ doz \$3.75&4.00
 P. D. & Co.....\$ doz \$3.75&4.00
 Shepard's Queen City.....40%

Fry Pans—

High List.....75&50&75&10
 No.....0 1 2 3 4
 \$ doz.....\$3.75 \$4.70 \$5.30 \$5.95 \$6.55
 No.....5 6 7 8
 \$ doz.....\$7.50 \$8.75 \$10.00 \$11.25
 Low List.....65&10%
 No.....0 1 2 3 4
 \$ doz.....\$3.00 \$3.75 \$4.35 \$4.75 \$5.25
 No.....5 6 7 8
 \$ doz.....\$5.00 \$7.00 \$8.00 \$9.00

Fuse—

Common Hemp Fuse, for dry ground.....\$2.70
 Common Cotton Fuse, for dry ground.....2.85
 Single Taped Fuse, for wet ground.....4.75
 Double Taped Fuse, for very wet gr.....6.00
 Triple Taped Fuse, for very wet gr.....7.25
 Small Gutta Percha Fuse, for water.....7.50
 Large Gutta Percha Fuse, for water.....12.00

Gauges—

Marking, Mortise, &c.....60&10%
 Starrett's Surface, Center and Scratch,
 25&10%
 Wire, low list.....10&10%
 Wire, Wheeler, Madden & Co.....10%
 Wire, Morse's.....50&50&55
 Wire, Brown & Sharpe's.....10&20%

Gimlets—

Nail and Spike.....50&10&55
 "Eureka" Gimlets.....40&10%
 "Diamond" Gimlets.....\$ gr \$5.00
 Double Cut, Shepardson's.....45&45&55
 Double Cut, Ives.....60&60&55
 Double Cut, Douglass.....40&10%
 "Bee".....\$ gr \$12, dis 25&25&55

Glue—

Le Page's Liquid.....25&25&55
 Upton's Liquid.....35%
 Le Page & Co.'s Improved Process.....25&25&55

Glue Pots—

Tinned and Enameled.....40&50&40&10%
 Family, Howe's "Eureka".....40%
 Family, L. F. C.'s "Handy".....60%

Grindstones—

Small, at factory.....\$ ton \$7.50@9.00

Grindstone Fixtures—

Sargent's Patent.....70&10%
 Reading Hardware Co.....30&10%

Hack Saws—

See Saws.

Halters—

Covert's, Rope, 1/2-in. Jute.....50&25
 Covert's, Rope, 1/2-in. Hemp.....40&25
 Covert's Adj. Rope Halters.....40&25
 Covert's Hemp Horse and Cattle Tie.....50&25
 Covert's Jute Horse and Cattle Ties.....60&10&25

Hammers—

Handled Hammers—
 Maydole's, list Dec. 1, '85.....25&25&10%
 Buffalo Hammer Co. (List Jan. 15, '87)
 Humason & Beckley.....50&50&10%
 Atha Tool Co.....40&10&50%
 Fayette R. Plumb.....40&10&50%
 C. Hammond & Son.....40&10&50%
 Verree.....1.75
 Magnetic Tack, Nos. 1, 2, 3, \$1.25, 1.50, &
 1.75.....dis 30&10%
 Nelson Tool Works.....40&10%
 Warner & Nobles.....20&25
 Peck, Stow & Wilcox.....40%
 Sargent's.....33&40%
 Heavy Hammers and Sledges—
 3 lb and under.....\$ b 40¢ / See Trade
 3 to 5 lb.....\$ b 30¢ / Report
 Over 5 lb.....\$ b 30¢ / Report
 Wilkinson's Smiths.....10%&11¢&12¢

Handcuffs and Leg Irons—

Providence Tool Co., Handcuffs,

Cross-Cut Saw Handles—
 Atkins No. 1 Loop, pair, 30¢; No. 3, 22¢; No. 2 and No. 4 Reversible, 22¢.
 Boynton's Loop Saw Handles, 50¢; dis 60¢
 Champion.....15¢

Hangers—
 Barn Door, old patterns.....60¢10¢10¢70¢
 Barn Door, New England.....60¢10¢10¢70¢
 Samson Steel Anti-Friction.....50¢
 Orleans Steel.....50¢
 Hamilton Wrought Wood Track.....50¢
 U. S. Wood Track.....50¢
 Champion.....60¢10¢
 Rider and Wooster, Medina Mfg. Co.'s list.....70¢
 Climax Anti-Friction.....70¢
 Climax Steel Anti-Friction.....50¢
 Zenith for Wood Track.....50¢
 Reed's Steel Arm.....50¢
 Challenge, Barn Door.....50¢
 Sterling's Improved (Anti-Friction).....65¢10¢
 Victor, No. 1, \$15.00; No. 2, \$10.00; No. 3, \$18.00.....dis 50¢25¢
 Cheritree.....50¢10¢
 The "Boomer".....50¢10¢80¢
 Best Anti-Friction.....80¢
 Duplex (Wood Track).....80¢
 Terry's Pat., pair pr. 4 in, \$10.00; 5 in, \$12.00.....dis 50¢25¢
 Cronk's Pat., No. 4, \$12.00; No. 5, \$14.40; No. 6, \$18.00.....dis 50¢15¢60¢
 Wood Track Iron Clad, pair ft. 10¢, dis 50¢
 Carrier Steel Anti-Friction.....50¢50¢10¢
 Architect.....pair set \$6.00, dis 20¢
 Eclipse.....20¢10¢
 Pelix.....pair set \$4.50, dis 20¢
 Richards.....30¢30¢10¢
 Lane's Steel Anti-Friction.....40¢10¢
 Ball Bearing Door Hanger.....20¢10¢25¢10¢
 Warner's Pat.....20¢20¢10¢
 Stearns' Anti-Friction.....20¢20¢10¢
 Stearns' Challenge.....25¢10¢25¢10¢10¢
 Faultless.....40¢40¢25¢
 American.....pair set \$6.00, dis 20¢10¢
 Rider & Wooster, No. 1, 62¢; No. 2, 75¢.....dis 40¢
 Paragon, Nos. 1, 2 and 3.....40¢10¢
 Paragon, Nos. 5, 5½, 7 and 8.....20¢10¢
 Crescent.....60¢60¢10¢
 Nickel Cast Iron.....50¢
 Nickel Malleable Iron and Steel.....40¢
 Scranton Anti-Friction Single Strap.....35¢40¢
 Scranton Anti-Friction Double Strap.....40¢
 Universal Anti-Friction.....40¢
 Wild West, 4 in. Wheel, \$15.00; 5 in. Wheel, \$21.00.....dis 45¢
 Star.....40¢10¢40¢10¢25¢
 May.....50¢50¢50¢10¢
 Barry, \$6.00.....dis 40¢10¢

Harness Snaps—

See Snaps.

Hatchets—

List Jan. 1, 1888.....35¢40¢
 Isaiah Blood.....40¢40¢
 Hunt's Shingling, Lath and Claw.....40¢40¢
 Hunt's Broad.....40¢40¢
 Buffalo Hammer Co.....40¢10¢10¢
 Hard.....40¢10¢50¢
 Fayette R. Plumb.....40¢10¢50¢
 Wm. Mann, Jr., & Co.....50¢50¢25¢
 Underhill Edge Tool Co.....40¢50¢40¢10¢
 Underhill's, Haines and Bright goods.....35¢40¢
 C. Hammond & Son.....40¢10¢40¢
 Simmons.....40¢10¢50¢
 Peck's.....40¢10¢40¢10¢25¢
 Kelly's.....50¢50¢25¢
 Sargent & Co.....50¢
 Ten Eyck Edge Tool Co.....40¢10¢40¢10¢50¢
 Collins, following list.....10¢
 Shingling, Nos. 1, 2, 3.....pair \$5.50, \$6.00, \$6.50
 Claw, Nos. 1, 2, 3.....pair \$6.00, \$6.50, \$7.00
 Lathing, Nos. 1, 2, 3.....pair \$5.50, \$6.00, \$6.50

Hay and Straw Knives—

Lightning.....Mfrs' price pair \$18.00, dis 25¢
 Jobbers' Extras.....
 Electric.....pair \$11, dis 30¢30¢25¢
 Gem.....pair \$10, dis 30¢30¢25¢
 Wadsworth's.....40¢7½¢40¢10¢
 Carter's Needle.....pair \$11.50, \$12.00
 Heath's.....pair \$13.50, \$14.00
 Auburn Hay, Common and Spear Point.....50¢
 Auburn Straw.....40¢

Hinges—

Wrought Iron Hinges
 Strap and T.....70¢10¢50¢70¢10¢10¢
 Screw Hook and.....14 to 20 in., pair.....34¢
 Strap.....22 to 36 in., pair.....34¢
 Heavy Welded.....14 to 20 in., pair.....34¢
 Hook.....22 to 36 in., pair.....34¢
 Screw Hook.....14 in., pair \$1.50; 10 in., pair \$2.45; 12 in., pair \$3.50; 10 in., pair \$3.50; 12 in., pair \$3.50
 Rolled Blind Hinges, Nos. 32 and 34.....50¢10¢
 Rolled Blind Hinges, Nos. 232 and 234.....55¢10¢
 Rolled Plate.....70¢10¢
 Rolled Raised.....70¢10¢
 Plate Hinges, 8, 10 and 12 in., pair.....55¢
 "Providence" over 12 in., pair.....45¢

Spring Hinges—

Geer's Spring and Blank Butts.....40¢
 Union Spring Hinge Co.'s list, March, 1888.....30¢
 Acme and U. S.....30¢
 Empire and Crown.....30¢
 Hero and Monarch.....50¢
 American, Gem, and Star, Japanned.....50¢
 American, Gem, and Star, Bronzed.....net
 Oxford, Bronze and Brass.....net
 Barker's Double Acting.....20¢10¢
 Union Mfg. Co.....10¢40¢25¢
 Boomer's.....30¢
 Beckman's.....15¢30¢
 Chicago.....30¢
 Wiley.....10¢
 Devore's.....40¢
 Rex.....40¢

Gate Hinges—

Western.....pair \$4.40, dis 60¢
 H. E. Reversible.....pair \$7.00, dis 55¢
 N. E. Reversible.....pair \$8.50, dis 55¢
 Clark's, Nos. 1, 2, 3.....60¢10¢25¢
 N. Y. State.....pair \$5.00, dis 55¢10¢
 Automatic.....pair \$12.50, dis 50¢

Common Sense.....pair \$4.50, dis 50¢
 Seymour's.....45¢10¢
 Shepard's.....60¢10¢50¢
 Reed's Latch and Hinges.....pair \$12.00, dis 50¢

Blind Hinges—

Parker.....75¢25¢
 Palmer.....60¢25¢10¢
 Seymour.....70¢25¢
 Nicholson.....45¢10¢
 Huffer.....50¢
 Clark's, Nos. 1, 3, 5, 40 and 50.....75¢10¢50¢80¢
 Clark's Mortise Gravity.....50¢
 Sargent's, Nos. 1, 3, 5, 11, 13.....75¢10¢75¢10¢50¢
 Sargent's, No. 12.....75¢10¢10¢
 Reading's Gravity.....75¢10¢75¢10¢50¢
 Shepard's Noiseless Niagara Buffalo, Champion, Steamboat, Clark's Old Pattern and Clark's Tip Pattern.....75¢10¢50¢
 Shepard's O. S. Lull & Porter.....75¢10¢50¢
 Shepard's Acme, Lull & Porter.....75¢10¢50¢
 Shepard's Queen City Reversible.....75¢
 Clark's Lull & Porter, Nos. 0, 1, 1½, 2, 2½, 3.....75¢10¢25¢40¢
 North's Automatic Blind Fixtures, No. 2, for Wood, \$10.50; No. 3, for Brick, \$13.50.....25¢25¢

Hoops—

Handled—
 Garden, Mortar, &c.....65¢
 Planter's, Cotton, &c.....65¢
 Warren Hoe.....80¢
 Magic.....pair \$5.40, dis 20¢

Eye—

D. & H. Scovill.....20¢
 Lane's Crescent Planter Pattern.....45¢25¢
 Lane's Razor Blade, Scovill Pattern.....30¢
 Maynard, S. O. Pat.....45¢25¢
 Sandusky Tool Co., S. O. Pat.....60¢
 Hubbard & Co., S. O. Pat.....60¢
 Bare, S. O. Pat.....60¢
 Grub.....60¢60¢10¢

Hog Rings and Rings—

Hill's Improved Rings.....pair \$4.50
 Hill's Old Style Rings.....pair \$3.00
 Hill's Rings.....pair \$2.50
 Hill's Rings.....pair \$2.25, \$2.40
 Perfect Rings.....pair \$1.75, \$2.00
 Perfect Rings.....pair \$2.50
 Blair's Hog Rings.....pair \$2.00, \$2.55
 Blair's Hog Rings.....pair \$2.50, \$3.00
 Champion Rings, Double.....pair \$2.50
 Brown's Rings.....pair \$2.00
 Brown's Rings.....pair \$1.25, \$1.30

Hoisting Apparatus—

"Moore's" Hand Hoist, with Lock Brake.....20¢
 "Moore's" Differential Pulley Block.....40¢
 Energy Mfg. Co.'s.....25¢

Holders, File and Tool—

Bals Pat.....pair \$4.00, dis 25¢
 Nicholson File Holders.....20¢

Hollow-Ware—

Iron—
 Stove Hollow-Ware, Ground.....60¢50¢60¢10¢
 Stove Hollow-Ware, Unground.....60¢10¢10¢70¢
 Enameled and Tinned Hollow-Ware.....70¢70¢50¢
 Kettles.....70¢70¢50¢
 Oval Boilers, Saccapans and Glue Pots.....40¢40¢50¢
 Gray Enameled Ware.....50¢10¢50¢10¢25¢
 Agate and Granite Ware.....25¢
 Rustless Hollow-Ware.....50¢50¢25¢
 Galvanized Tea-Kettles.....

Inch.....6 7 8 9
 Each.....55¢ 60¢ 65¢ 75¢

Silver Plated—

4 mo. or 5¢ cash in 30 days.
 Reed & Barton.....40¢25¢
 Meriden Britannia Co.....40¢25¢
 Simpson, Hall, Miller & Co.....40¢25¢
 Rogers & Brother.....40¢25¢
 Hartford Silver Plate Co.....40¢25¢
 William Rogers Mfg. Co.....40¢25¢

Hooks—

Cast Iron—
 Bird Cage, Sargent's list.....60¢10¢10¢
 Bird Cage, Reading.....60¢10¢10¢
 Clothes Line, Sargent's list.....60¢10¢10¢
 Clothes Line, Reading list.....60¢10¢10¢10¢
 Ceiling, Sargent's list.....55¢10¢10¢
 Harness, Reading list.....55¢10¢55¢10¢10¢
 Coat and Hat, Sargent's list.....55¢10¢60¢10¢
 Coat and Hat, Reading.....50¢10¢50¢10¢10¢

Wrought Iron—

Cotton.....pair \$1.25
 Cotton Pat. (N.Y. Mallet & Handle Wks.).....30¢
 Tassel and Picture (T. & S. Mfg. Co.).....50¢
 Wrought Staples, Hooks, &c.....See Wrought Goods.
 Bench Hooks.....See Bench Stops.

Wire—

Wire Coat and Hat, Gem, list April, 1888.....45¢
 Wire Coat and Hat, Miles', list April, 1888.....45¢
 Indestructible Coat and Hat.....45¢
 Wire Coat and Hat, Standard.....45¢
 Belt.....75¢10¢60¢
 Grass, No. 2, \$2.00; No. 3, \$2.25; No. 4, \$2.50.....55¢60¢
 Bush.....55¢60¢
 Whitcomb-Patent.....55¢
 Hooks and Eyes—Malleable Iron.....70¢70¢10¢
 Fish Hooks, American.....50¢

Horse Nails—

Nos. 6 7 8 9 10
 Ausable.....28¢ 26¢ 25¢ 24¢ 23¢
 Clinton, Fin.....24¢ 22¢ 21¢ 20¢ 19¢
 Essex.....28¢ 26¢ 25¢ 24¢ 23¢
 Lyra.....25¢ 23¢ 22¢ 21¢ 20¢
 Snowden.....25¢ 23¢ 22¢ 21¢ 20¢
 Putnam.....24¢ 22¢ 21¢ 20¢ 19¢
 Vulcan.....23¢ 21¢ 20¢ 19¢ 18¢
 Northwest.....25¢ 23¢ 22¢ 21¢ 20¢
 Globe.....23¢ 21¢ 20¢ 19¢ 18¢

A. C.....25¢ 23¢ 22¢ 21¢ 20¢
 C. B. K.....25¢ 23¢ 22¢ 21¢ 20¢
 Champlain.....28¢ 26¢ 25¢ 24¢ 23¢
 New Haven.....28¢ 26¢ 25¢ 24¢ 23¢
 Saranac.....23¢ 21¢ 20¢ 19¢ 18¢
 Champion.....25¢ 23¢ 22¢ 21¢ 20¢
 Capewell.....28¢ 26¢ 25¢ 24¢ 23¢
 Star.....23¢ 21¢ 20¢ 19¢ 18¢
 Anchor.....23¢ 21¢ 20¢ 19¢ 18¢
 Western.....23¢ 21¢ 20¢ 19¢ 18¢
 Empire Bronzed.....14¢ 13¢

Horse Shoes—See Shoes Horse.

Hose, Rubber—

Competition.....75¢10¢75¢10¢50¢
 Standard.....70¢70¢10¢
 Extra.....6¢60¢10¢
 N. Y. B. & P. Co., Para.....30¢10¢
 N. Y. B. & P. Co., Extra.....50¢
 N. Y. B. & P. Co., Dundee.....60¢10¢50¢

Huskers—

Blair's Adjustable.....pair \$8.00
 Blair's Adjustable Clipper.....pair \$7.00

Jack Screws—See Screws.

Kettles—

Brass, 7 to 17 in., pair.....24¢ 21¢
 Brass larger than 17 in., pair.....24¢ 23¢
 Enameled and Tea Kettles.....See Hollow-Ware.

Keys—

Lock Ass'n list Dec. 30, 1888.....50¢10¢
 Eagle, Cabinet, &c.....33¢42¢
 Hotchkiss' Brass Blanks.....40¢
 Hotchkiss, Copper and Tinned.....40¢
 Hotchkiss' Pad, and Cab.....35¢
 Hatchet Bed Keys.....pair \$4.00, dis 15¢
 Wollensak Tinned.....50¢10¢

Knife Sharpeners—

Pardin's Applewood Handles.....pair \$2.00
 Pardin's Rosewood or Cocobolo.....pair \$2.00, dis 40¢

Knives—

Wilson's Butcher Knives.....25¢30¢
 Ames' Butcher Knives.....25¢
 Foster Bros' Butcher, &c.....40¢
 Nichols' Butcher Knives.....40¢10¢
 Ames' Shoe Knives.....20¢25¢
 Ames' Bread Knives.....pair \$1.50, dis 15¢
 Moran's Shoe and Bread.....20¢
 Hay and Straw.....See Hay Knives.
 Table and Pocket.....See Cutlery.
 Corn, Auburn Mfg. Co. Western Pat.....\$2.00
 Corn, Auburn Mfg. Co. Crescent.....\$3.50

Knobs—

Door Mineral.....65¢68¢
 Door Por. Nap'd.....75¢78¢
 Door Por. Jickel.....\$2.00, \$2.25
 Door Por. Plated, Nickel.....\$2.00, \$2.25
 Drawer, Porcelain.....60¢10¢50¢10¢10¢
 Hematche Door Knobs.....40¢10¢60¢
 Yale & Towne Wood, list Dec. 1888.....40¢
 Furniture, Plain.....75¢ gro inch, dis 10¢
 Furniture, Wood Screws.....25¢10¢
 Base, Rubber Tip.....70¢10¢25¢
 Picture, Judd's.....60¢10¢10¢70¢
 Picture, Sargent's.....70¢10¢
 Picture, Hematche.....35¢25¢
 Shutter, Porcelain.....65¢10¢
 Carriage, Jap.....pair \$6.00, dis 60¢10¢

Ladies—

Melting, Sargent's.....55¢10¢
 Melting, Reading.....35¢10¢
 Melting, Monroe's Pat.....pair \$4.00, dis 40¢
 Melting, P. S. & W.....35¢10¢40¢
 Melting, Warner's.....30¢

Lawn Mowers—

Standard List.....50¢10¢
 Enterprise.....60¢10¢

Lanterns—

Tabular—
 Plain with Guards, pair.....\$4.00, \$4.25
 Lift Wire, with Guards, pair.....\$1.50, \$4.75
 Square Plain, with Guards, pair.....\$4.00, \$4.25
 Sq. Lift Wire, with Guards, pair.....\$4.25, \$4.50
 Without Guards, 25¢ pair less.....
 Police, Small, \$6.00; Medium, \$7.25; Large, \$9.75.....dis 20¢25¢

Lemon Squeezers—

Porcelain Lined, No. 1, pair \$6.00, dis 25¢30¢
 Wood, No. 2.....pair \$3.00, dis 35¢
 Wood, Common.....pair \$1.70, \$1.75
 Dunlap's Improved.....pair \$1.75, dis 20¢
 Sammis.....No. 1, \$5.00; No. 2, \$6.12; \$18 pair \$10.....dis 25¢10¢
 Jennings' "Star".....pair \$2.50
 The "Boss".....pair \$2.50
 Dean's.....Nos. 1, pair \$6.50; 2, \$3.35; 3, \$1.90
 Little Giant.....50¢50¢25¢
 King.....40¢25¢

Lines—

Cotton and Linen Fish, Draper's.....50¢
 Draper's Chalk.....60¢
 Draper's Mason's Linen, 84 ft., No. 1, \$1.25; No. 2, \$1.75; No. 3, \$2.25; No. 4, \$2.75; No. 5, \$3.25.....dis 25¢
 Cotton Chalk.....50¢
 Samson, Cotton, No. 4, \$2. No. 4½, \$2.50; No. 5, \$3.00; No. 6, \$3.50; No. 7, \$4.00; No. 8, \$4.50; No. 9, \$5.00; No. 10, \$5.50; No. 11, \$6.00; No. 12, \$6.50; No. 13, \$7.00; No. 14, \$7.50; No. 15, \$8.00; No. 16, \$8.50; No. 17, \$9.00; No. 18, \$9.50; No. 19, \$10.00; No. 20, \$10.50; No. 21, \$11.00; No. 22, \$11.50; No. 23, \$12.00; No. 24, \$12.50; No. 25, \$13.00; No. 26, \$13.50; No. 27, \$14.00; No. 28, \$14.50; No. 29, \$15.00; No. 30, \$15.50; No. 31, \$16.00; No. 32, \$16.50; No. 33, \$17.00; No. 34, \$17.50; No. 35, \$18.00; No. 36, \$18.50; No. 37, \$19.00; No. 38, \$19.50; No. 39, \$20.00; No. 40, \$20.50; No. 41, \$21.00; No. 42, \$21.50; No. 43, \$22.00; No. 44, \$22.50; No. 45, \$23.00; No. 46, \$23.50; No. 47, \$24.00; No. 48, \$24.50; No. 49, \$25.00; No. 50, \$25.50; No. 51, \$26.00; No. 52, \$26.50; No. 53, \$27.00; No. 54, \$27.50; No. 55, \$28.00; No. 56, \$28.50; No. 57, \$29.00; No. 58, \$29.50; No. 59, \$30.00; No. 60, \$30.50; No. 61, \$31.00; No. 62, \$31.50; No. 63, \$32.00; No. 64, \$32.50; No. 65, \$33.00; No. 66, \$33.50; No. 67, \$34.00; No. 68, \$34.50; No. 69, \$35.00; No. 70, \$35.50; No. 71, \$36.00; No. 72, \$36.50; No. 73, \$37.00; No. 74, \$37.50; No. 75, \$38.00; No. 76, \$38.50; No. 77, \$39.00; No. 78, \$39.50; No. 79, \$40.00; No. 80, \$40.50; No. 81, \$41.00; No. 82, \$41.50; No. 83, \$42.00; No. 84, \$42.50; No. 85, \$43.00; No. 86, \$43.50; No. 87, \$44.00; No. 88, \$44.50; No. 89, \$45.00; No. 90, \$45.50; No. 91, \$46.00; No. 92, \$46.50; No. 93, \$47.00; No. 94, \$47.50; No. 95, \$48.00; No. 96, \$48.50; No. 97, \$49.00; No. 98, \$49.50; No. 99, \$50.00; No. 100, \$50.50; No. 101, \$51.00; No. 102, \$51.50; No. 103, \$52.00; No. 104, \$52.50; No. 105, \$53.00; No. 106, \$53.50; No. 107, \$54.00; No. 108, \$54.50; No. 109, \$55.00; No. 110, \$55.50; No. 111, \$56.00; No. 112, \$56.50; No. 113, \$57.00; No. 114, \$57.50; No. 115, \$58.00; No. 116, \$58.50; No. 117, \$59.00; No. 118, \$59.50; No. 119, \$60.00; No. 120, \$60.50; No. 121, \$61.00; No. 122, \$61.50; No. 123, \$62.00; No. 124, \$62.50; No. 125, \$63.00; No. 126, \$63.50; No. 127, \$64.00; No. 128, \$64.50; No. 129, \$65.00; No. 130, \$65.50; No. 131, \$66.00; No. 132, \$66.50; No. 133, \$67.00; No. 134, \$67.50; No. 135, \$68.00; No. 136, \$68.50; No. 137, \$69.00; No. 138, \$69.50; No. 139, \$70.00; No. 140, \$70.50; No. 141, \$71.00; No. 142, \$71.50; No. 143, \$72.00; No. 144, \$72.50; No. 145, \$73.00; No. 146, \$73.50; No. 147, \$74.00; No. 148, \$74.50; No. 149, \$75.00; No. 150, \$75.50; No. 151, \$76.00; No. 152, \$76.50; No. 153, \$77.00; No. 154, \$77.50; No. 155, \$78.00; No. 156, \$78.50; No. 157, \$79.00; No. 158, \$79.50; No. 159, \$80.00; No. 160, \$80.50; No. 161, \$81.00; No. 162, \$81.50; No. 163, \$82.00; No. 164, \$82.50; No. 165, \$83.00; No. 166, \$83.50; No. 167, \$84.00; No. 168, \$84.50; No. 169, \$85.00; No. 170, \$85.50; No. 171, \$86.00; No. 172, \$86.50; No. 173, \$87.00; No. 174, \$87.50; No. 175, \$88.00; No. 176, \$88.50; No. 177, \$89.00; No. 178, \$89.50; No. 179, \$90.00; No. 180, \$90.50; No. 181, \$91.00; No. 182, \$91.50; No. 183, \$92.00; No. 184, \$92.50; No. 185, \$93.00; No. 186, \$93.50; No. 187, \$94.00; No. 188, \$94.50; No. 189, \$95.00; No. 190, \$95.50; No. 191, \$96.00; No. 192, \$96.50; No. 193, \$97.00; No. 194, \$97.50; No. 195, \$98.00; No. 196, \$98.50; No. 197, \$99.00; No. 198, \$99.50; No. 199, \$100.00; No. 200, \$100.50; No. 201, \$101.00; No. 202, \$101.50; No. 203, \$102.00; No. 204, \$102.50; No. 205, \$103.00; No. 206, \$103.50; No. 207, \$104.00; No. 208, \$104.50; No. 209, \$105.00; No. 210, \$105.50; No. 211, \$106.00; No. 212, \$106.50; No. 213, \$107.00; No. 214, \$107.50; No. 215, \$108.00; No. 216, \$108.50; No. 217, \$109.00; No. 218, \$109.50; No. 219, \$110.00; No. 220, \$110.50; No. 221, \$111.00; No. 222, \$111.50; No. 223, \$112.00; No. 224, \$112.50; No. 225, \$113.00; No. 226, \$113.50; No. 227, \$114.00; No. 228, \$114.50; No. 229, \$115.00; No. 230, \$115.50; No. 231, \$116.00; No. 232, \$116.50; No. 233, \$117.00; No. 234, \$117.50; No. 235, \$118.00; No. 236, \$118.50; No. 237, \$119.00; No. 238, \$119.50; No. 239, \$120.00; No. 240, \$120.50; No. 241, \$121.00; No. 242, \$121.50; No. 243, \$122.00; No. 244, \$122.50; No. 245, \$123.00; No. 246, \$123.50; No. 247, \$124.00; No. 248, \$124.50; No. 249, \$125.00; No. 250, \$125.50; No. 2

Melasses Gates—				
Stebbin's Pat.	70	70	70	70
Stebbin's Genuine	60	10	10	10
Stebbin's Tinned Ends	40	10	10	10
Chase's Hard Metal	50	10	10	10
Bush's	80			
Lincoln's Pattern	70	70	10	10
Weed's	20	10		
Boss, per doz.				
No. 1	2	3	4	
No. 2	7	8	9	10
No. 3	10	10	10	10

Money Drawers... per doz, \$18.00 to \$20

Mazdales—
Safety... per doz, \$3.00 dis 25%

Nails, see Trade Report.

Wire Nails & Brads, list July 14, '87

Wire Nails, Standard Penny... per keg \$2.45 to \$2.55

Nail Puller—
Curries Hammer... per doz \$0.00, net

Giant, No. 1... per doz, \$30.00, dis 10%

Polican... per doz, \$0.00, dis 10%

Boss... per doz, \$30.00, dis 30%

Lightning... per doz \$21.00

Nail Sets—
Square... per gr., \$4.00 to \$4.25

Round... per gr., \$3.25

Cannon's Diamond Point... per gr., \$12.20%

Nut Crackers—
Table (H. & B. Mfg. Co.)... 40%

Blake's Pattern... per doz \$2.00, dis 10%

Turner & Seymour Mfg. Co... 50%

Nuts—
off list Jan. 1, 1888: Square, Hex.

Hot Pressed... 5.4¢ 5.9¢

Cold Punched... 5.4¢ 5.9¢

In lots less than 100 lb, per lb, add 1/4¢; 1-lb boxes, add 1/2¢ to list.

Oakum—
Government... per lb 8¢

U. S. Navy... per lb 7¢

Navy... per lb 6¢ to 6 1/4¢

Oilers—
Zinc and Tin... 65¢ to 65 1/2%

Brass and Copper... 50¢ to 50 1/2%

Malleable, Hammers' Improved, No. 1, \$3.60; No. 2, \$4.00; No. 3, \$4.40 per doz, dis 10% to 10 1/2%

Malleable, Hammers, Old Pattern, same list... 40%

Prior's Pat. or "Paragon" Zinc... 60¢ to 10 1/2%

Prior's Pat. or "Paragon" Brass... 50%

Olmstead's Tin and Zinc... 60%

Olmstead's Brass and Copper... 50%

Broughton's Zinc... 60%

Broughton's Brass... 50%

Packing, Steam—
Rubber—

Standard... 60¢ to 10 1/2%

Extra... 50¢ to 10 1/2%

N. Y. B. & P. Co., Standard... 50¢ to 10 1/2%

N. Y. B. & P. Co., Empire... 70%

N. Y. B. & P. Co., Salamander... 70%

Jenkins' Standard... per doz, dis 30%

Jenkins' Standard... per doz, dis 35%

Miscellaneous—
American Packing... 10¢ to 11¢

Russell Packing... 14¢

Italian Packing... 14¢

Cotton Packing... 15¢ to 17¢

Jute... 7¢ to 8¢

Padlocks—
See Locks.

Falls—
Galvanized Iron—

Quartz... 10 12 14

Hill's Light Weight, per doz. \$2.75 3.00 3.25

Hill's Heavy Weight, per doz. \$2.80 3.25 3.75

Whiting's... 2.75 3.00 3.25

Sidney Shepard & Co... 2.80 3.00 3.40

Iron Clad... 2.75 3.00 3.25

Fire Buckets... 2.75 3.25 3.50

Buckets, see Well Buckets.

Indurated Fibre Ware—
Star Pails, 12 qt... per doz \$4.50

Fire, Stable and Milk, 14 qt... per doz \$5.50

Pencils—
Faber's Carpenters'... high list 50%

Faber's Round Gilt... per gro \$6.25 net

Dixon's Lead... per gro \$4.50 net

Dixon's Lumber... per gro \$6.75 net

Dixon's Carpenters'... per gro \$10.10

Picks—
Railroad or Adze Eye, 5 to 6, \$12.00; 6 to 7, \$13.00... dis 60% to 80% to 85%

Picture Nails—
Brass Head, Sargent's list... 50¢ to 10 1/2%

Brass Head, Combination list... 50¢ to 10 1/2%

Porcelain Head, Sargent's list... 50¢ to 10 1/2%

Porcelain Head, Combination list... 40¢ to 10 1/2%

Niles' Patent... 40%

Pinking Irons— per doz 65¢ net

Pipe, Wrought Iron—
List March 23, 1887.

1 1/4 and under, Plain... 52 1/2%

1 1/4 and under, Galvanized... 45%

1 1/4 and over, Plain... 62 1/2%

1 1/4 and over, Galvanized... 52 1/2%

Bolier Tubes, Iron... 60%

Plane Irons—		
Plane Irons, Butcher's	20	10 1/2%
Plane Irons, Buck Bros	50	00 to 2
Plane Irons, Auburn Tool Co., "This is the"	30	
Plane Irons, Auburn Tool Co., "This is the"	40	
Sandusky Tool Co.	30	
Single and Cut	40	
Double	40	
L. & I. J. White	25	

Pliers and Nippers—
Button's Patent... 30¢ to 40%

Hall's No. 2, 5 in., \$13.50; No. 4, 7 in., \$21.00 per doz... dis 20% to 35%

Humason & Beckley Mfg. Co. 50¢ to 10 1/2%

Gas Pliers... 60%

Gas Pliers, Custar's Nickel Plated... 60¢ to 5%

Eureka Pliers and Nippers... 40%

Russell's Parallel... 25%

P. S. & W. Cast Steel... 50%

P. S. & W. Tinnars' Cutting Nippers... add 6% dis 10%

Carew's Pat. Wire Cutters... 20%

Morrill's Parallel, per doz, \$12.00... 30¢ to 5%

Cronk's 8 in., \$15.00; 10 in., \$21.00... 40¢ to 40 1/2%

Plumbs and Levels—
Regular List... 70¢ to 10 1/2% to 70¢ to 10 1/2%

Disston's... 70¢ to 10 1/2% to 70¢ to 10 1/2%

Pocket Levels... 70¢ to 10 1/2% to 70¢ to 10 1/2%

Davis Iron Levels... 30%

Davis' Inclination... 10¢ to 10 1/2%

Poppers, Corn—
Round or Square, 1 qt... per gr \$12.00 to 15.00

Round or Square, 2 qt... per gr \$25.00 to 26.00

Post Hole and Tree Augers and Diggers—
Samson Post Hole Digger, per doz \$36.00, dis 25¢ to 10 1/2%

Fletcher Post Hole Augers, per doz \$36.00, dis 25¢ to 10 1/2%

Eureka Diggers... per doz \$16.00 to 17.00

Leed's... per doz \$8.00 to 9.00

Vaughan's Post Hole Auger, per doz \$13.00 to 14.00

Kohler's Little Giant... per doz \$18.00

Kohler's Hercules... per doz \$18.00

Kohler's New Champion... per doz \$18.00

Schneider... 40¢ to 40 1/2%

Ryan's Post Hole Diggers... per doz \$24.00

Cronk's Post Hole Bars, per doz \$60.00, dis 50¢ to 50 1/2% to 10 1/2%

Gibb's Post Hole Digger, per doz \$30.00, dis 40¢ to 40 1/2%

Potato Parers—
White Mountain... per doz \$5.00 to 5.50

Antrim Combination... per doz \$5.00

Hoosier... per doz \$13.50

Pruning Hooks and Shears—
Disston's Combined Pruning Hook and Saw... per doz \$18.00, dis 20¢ to 10 1/2%

Sibson's Pruning Hook... per doz \$12.00, dis 20¢ to 10 1/2%

E. S. Lee & Co.'s Pruning Tools... 40%

Pruning Shears, Henry's Pat... per doz \$3.75 to 4.00 net

Henry's Pruning Shears, per doz \$4.25 to 4.50 net

Wheeler, M. & Co.'s Combination, per doz \$12.00, dis 20%

Dunlap's Saw and Chisel, per doz \$8.50, dis 30%

J. Mallinson & Co., No. 1, \$5.25; No. 2, 7.25

Pulleys—
Hot House, Awning, &c... 60¢ to 10 1/2%

Japanned Screw... 60¢ to 10 1/2%

Brass Screw... 60¢ to 10 1/2%

Japanned Side... 60¢ to 10 1/2%

Japanned Clothes Line... 60¢ to 10 1/2%

Empire Sash Pulley... 55¢ to 60%

Moore's Sash, Anti-Friction... 55¢ to 60%

Hay Fork, Solid Eye, \$4.00; Swivel, \$4.50... dis 50¢ to 10 1/2% to 50¢ to 10 1/2%

Hay Fork, "Anti-Friction," 5 in. Solid, \$6.70... dis 50%

Hay Fork, "F" Common and Pat... dis 50%

Hay Fork, Tarpaulin Pat. Iron... 60%

Hay Fork, Reed's Self-Lubricating... 60%

Shade Rack... 45%

Tackle Blocks... See Blocks

Pumps—
Clisner, Best Makers... 50¢ to 10 1/2% to 60¢ to 10 1/2%

Pitcher Spout, Best Makers... 60¢ to 10 1/2%

Pitcher Spout, Cheaper Goods... 70¢ to 85%

Punches—
Saddlers' or Drive, good quality, per doz 60¢ to 65¢

Bemis & Call Co.'s Cast Steel Drive... 50¢ to 55%

Bemis & Call Co.'s Spring Steel Socket... 50¢ to 55%

Spring, good quality... per doz \$2.50 to 2.80

Spring, Leuch's Pat... per doz \$2.50 to 2.80

Bemis & Call Co.'s Spring and Check... 40%

Solid Tinnars'... per doz \$1.44, dis 55%

Tinnars' Hollow Punches... 20¢ to 25%

Rice Hand Punches... 15%

Avery's Revolving... 30¢ to 10 1/2%

Avery's Saw-Set and Punch. See Saw Sets.

Rail—
Sliding Door, Wrt's Brass, per lb 35¢, dis 15%

Sliding Door, Bronzed Wrt's Iron, per ft. 7¢

Sliding Door, Iron, Painted... per foot 4¢

Barn Door, Light In. 1/4, 3/4, 1, 1 1/4, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634

Machines—	
Vlat Head, Iron.....	55%
Round Head, Iron.....	50%
Bench and Hand—	
Bench, Iron.....	55&10&55&10&10%
Bench, Wood, Beech.....	50%
Bench, Wood, Hickory.....	20&10%
Hand, Wood.....	25&10&25&10&5%
Lag, Blunt Point.....	75&75&10%
Couch and Lag, Gimlet Point.....	75%
Hand, Sargent's.....	60&10%
Hand, H. & B. Mfg. Co.....	70&10&75%
Hand, Am. Screw Co.....	75%
Jack Screws, Millers Falls list.....	50&50&5%
Jack Screws, P. S. & W.....	35%
Jack Screws, Sargent.....	60&10&60&10&5%
Jack Screws, Stearns.....	40&10&10%
Scroll Saws—	
Lester, complete, \$10.00.....	25%
Rogers, complete, \$1.00.....	25%
Barnes' Builders' and Cabinet Makers.....	\$15
Barnes' Scroll Saw Blades.....	35%
Seythe Smiths—	
American (Cast) Iron.....	75&10&75&10&5%
Pruning.....	See Pruning Hooks and Shears.
Barnard's Lamp Trimmers.....	50&50&5%
Tinners.....	30&25%
Seymour's, List, Dec. 1887.....	60&10&10&60&10&10&5%
Heinrich's, List, Dec. 1887.....	60&10&10&60&10&10&5%
Heinrich's Tailor's Shears.....	30&25%
First quality C. S. Trimmers.....	80&80&10%
Second quality C. S. Trimmers.....	80&10&80&10&10%
Acme Cast Shears.....	10&10%
Diamond Cast Shears.....	10%
Clippers.....	10&10%
Victor Cast Shears.....	75&10&75&10&5%
Howe Bros. & Hubert, Solid Forged Steel.....	40%
Cleveland Machine Co., Solid Steel Forged.....	70%
Clausen Shear Co., Japanned.....	70%
Clausen Shear Co., Nickel, same list.....	60%
Sheaves—	
Sliding Door—	
N. W. & Co., list July, 1888.....	50&10&50&10&50%
R. & E., list Dec. 18, 1886.....	55&20%
Corbin's list.....	60&10&25%
Patent Roller.....	90&10&25%
Patent Roller, Hatfield's.....	75%
Russell's Anti-Friction, list Dec. 18, 1885.....	60&25%
Moore's Anti-Friction.....	60%
Sliding Shutter—	
R. & E., list Dec. 18, 1886.....	60&10&25%
Sargent's list.....	60&10%
Reading list.....	60&10&10%
Ship Tools—	
L. & I. J. White.....	20&25%
Albertson Mfg. Co.....	25%
Shoes, Horse, Mule, &c.—	
Horse—	
Burden's, Perkins', Phoenix, at factory.....	\$1.00
Mule—	
Add \$1 per keg to above prices.	
Or, Wrought—	
Ton lots.....	75¢
1000 lb lots.....	50¢
500 lb lots.....	10¢
Shot—	
(Eastern prices 2% off, cash, 5 days.)	
Drop, 25 lb bag.....	\$1.10
Drop, 5 lb bag.....	20
Back and Cullied, 25 lb bag.....	1.11
Back and Cullied, 5 lb bag.....	.34
Shovels and Spades—	
Ames' Shovels, Spades, &c., list Nov. 1, 1885.....	20%
Note—Jobbers frequently give 50¢ off 75¢ extra on above.	
Griffin's Black Iron.....	50&10%
Griffin's C. B.....	60&80&10%
Griffin's Solid C. S. R. R. Goods.....	20%
Old Colony (Sanford Fork & Tool Co.).....	20%
St. Louis Shovel Co.....	20&20&75%
Hussey, Binns & Co.....	15&25%
Hubbard & Co.....	20&20&75%
Lehigh Mfg. Co.....	50&10%
Payne Petebone & Son, list January, 1886.....	30%
Remington's (Lowman's Patent).....	30&10&40%
Rowland's, Black Iron.....	50&10%
Rowland's Steel.....	60&5&60&10%
Shovels and Tongs—	
Iron Head.....	60&10&60&10&5%
Brass Head.....	60&10&10%
Skins, Thimble—	
Western list.....	75&5&75&10%
Columbus Wrt. Steel, list Nov. 1, 1887.....	20%
Coldbrookdale Iron Co.....	50&10%
Utica P. S. T. Skins.....	60%
Utica Turned and Fitted.....	35%
Sieves—	
Buffalo Metallic, S. S. & Co., new list.....	50&25&10%
Barier Flour Sifters.....	50¢
Smith's Adjustable Sifters.....	50¢
Smith's Adjustable Milk Strainer.....	50¢
Smith's Adjustable F. & C. Strainer.....	50¢
Sieves, Wooden Rim—	
Mesh 18, Nested, 5 doz.....	70¢
Mesh 20, Nested, 5 doz.....	85¢
Mesh 24, Nested, 5 doz.....	1.10
Slates—	
School, by case.....	50&10%
Snaps, Harness, &c.—	
Anchor (T. & S. Mfg. Co.).....	65%
Fitch's (Bristol).....	50&10%
Hotchkiss.....	10%
Andrews.....	50%
Sargent's Patent Guarded.....	70&10&10%
German, new list.....	40&10%
Covert, new Patent.....	50&25%
Covert, New R. E.....	50&25%
Covered Spring.....	60&10&10%

Soldering Irons—	
Covert's Adjustable, list Jan. 1, 1886.....	35&25%
Spoke Shaves—	
Iron.....	45%
Wood.....	30%
Hall's (Stanley R. & L. Co.).....	30%
Stearns.....	20&10&30%
Spoke Trimmers—	
Bonney's.....	50¢
Ives, No. 1, \$15.00; No. 2, \$12.00 per doz.....	55&10%
Douglas.....	50¢
Spoons and Forks—	
Tinned Iron—	
Solid Table and Tea, Cen. Stamp. Co.'s list.....	70&10%
list.....	70&10%
Buffalo S. S. & Co.....	33&25%
Silver-Plated—(4 mos. or 5% cash 30 days.)	
Meriden Brit. Co., Rogers.....	50%
C. Rogers & Bros.....	50%
Rogers & Bros.....	50%
Reed & Barton.....	50%
Wm. Rogers Mfg. Co.....	50&10&50%
Simpson, Hall, Miller & Co.....	50&10%
Holmes & Edwards Silver Co.....	50&10%
H. & E. Silver Co., Mexican Silver.....	50&5%
H. & E. Silver Co., Durham Silver.....	50&5%
German Silver, Hall & Elton.....	50&5%
German Silver, Hall & Elton.....	50&5%
Nickel Silver.....	50&5%
Britannia.....	50%
Boardman's Flat Ware.....	50&10%
Boardman's Nickel Silver.....	50%
Boardman's Britannia Spoons, case lots.....	60%
Springs—	
Elliptic, Concord, Platform and Half Spring.....	60&60&5%
Cliff's Bolster Springs.....	25%
Squares—	
Steel and Iron.....	75&10&80%
Nickel-Plated.....	75&10&80%
Try Square and T Bevels.....	60&10&10&70%
Dixon's Try Square and T Bevels.....	40&10%
Winterbottom's Try and Miter.....	30&10%
Starrett's Micrometer Caliper Squares.....	25%
Avery's Flush Bevel Squares.....	30&5%
Staples—	
Fence Staples, Galvanized.....	Same price as 17¢ wire.
Fence Staples, Plain.....	See Trl. Rep.
Steelyards—	
40&10&50%	
Stocks and Dies—	
Blacksmith's Waterford Goods.....	30%
Blacksmith's Butterfield's Goods.....	30%
Lighting Screw Plate.....	25&20%
Reece's New Screw Plates.....	33&25&10%
Stone—	
Hindustan No. 1, 3¢; Axe, 3¢; Slips No. 1, 5¢	
Sand Stone.....	75¢
Washita Stone, Extra.....	21¢
Washita Stone, No. 1.....	15¢
Washita Stone, No. 2.....	11¢
Washita Stone, No. 3.....	10¢
Washita Stone, No. 4.....	10¢
Washita Stone, No. 5.....	10¢
Arkansas Stone, No. 1, 4 to 6 in.....	1.30
Arkansas Stone, No. 1, 6 to 9 in.....	1.75
Turkey Oil Stone, 4 to 8 in.....	1.40
Turkey Slips.....	1.00
Lake Superior, Chase.....	31¢
Lake Superior Slips, Chase.....	31¢
Seneca Stone, Red Paper Brand.....	18¢
Seneca Stone, High Rounds.....	20¢
Seneca Stone, Small Whets.....	24¢
Stove Polish—	
Joseph Dixon's.....	50¢
Gem.....	50¢
Gold Medal.....	50¢
"Mirror".....	50¢
Lustro.....	50¢
Ruby.....	50¢
Rising Sun, 5 gro lots.....	50¢
Dixon's Plumbago.....	50¢
Boynton's Noon Day.....	50¢
Parlor Pride Stove Enamel.....	50¢
Yates' Liquid.....	50¢
Yates Standard Paste Polish, 10 lb cans.....	50¢
Jet Black.....	50¢
Japanese.....	50¢
Fireclay.....	50¢
Diamond O. K. Enamel.....	50¢
Bonelli's Liquid Stove Polish.....	50¢
Bonelli's Paste Stove Polish.....	50¢
Black Eagle Benzine Paste, 5 and 10 lb cans.....	50¢
Black Jack Water Paste, 5 and 10 lb cans.....	50¢
Nickel Plate Paste.....	50¢
Tacks, Brads, &c.—	
List, Jan. 2, 1888.—(Note.—Some manufacturers are selling tacks at slightly higher prices than those named.)	
American Iron Carpet.....	80¢
Swedes Iron Carpet.....	80¢
American Iron Cut.....	75¢
Swedes Iron.....	75¢
Swedes Iron, Upholsterers.....	75¢
Tinned Swedes Iron.....	75¢
Tinned Swedes Iron, Upholsterers.....	75¢
Gimp and Lace.....	75¢
Tinned Gimp and Lace.....	75¢
Swedes Iron Trimmers.....	75¢
Swedes Iron Miners.....	75¢
Swedes Iron Bill Posters or Railroad.....	75¢
Swedes Steel (Swedes Iron price list).....	80¢
Copper Tacks.....	80¢
Copper Finishing, Trunk and Clout Nails.....	50¢
Finishing Nails.....	70&10&70&10&10%
Trunk and Clout Nails.....	70&10&70&10&10%
Tinned Trunk and Clout Nails.....	70&10%
Basket Nails.....	70&10&70&10&10%

Common and Patent Brads, 70&10&70&10&10%	
Hungarian Nails.....	70&10&70&10&10%
Chair Nails.....	70&10&70&10&10%
Zinc Glaziers' Points.....	50&50&5%
Cigar Box Nails.....	50&10&50&10&5%
Picture-Frame Points.....	50&10&50&10&5%
Looking-Glass Tacks.....	50&10&50&10&5%
Leathered Carpet.....	50&10&50&10&5%
Brush Tacks.....	50&10&50&10&5%
Shoe Finders, list Jan. 2, 1888.....	10&10%
Lining and Saddle Nails, list Jan. 1, 1888:	
Silvered.....	30&10&10%
Japanned.....	20&10&10%
Double-Pointed Tacks.....	50¢
Wire Carpet Nails.....	50&10%
Wire Brads & Nails, see Nails, Wire.	
Steel-Wire Brads, K. & E. Mfg. Co.'s list.....	50&10%
Tap Borers—	
Common and Rind.....	20&10%
Ive's Tap Borers.....	33&5%
Enterprise Mfg. Co.....	20&10%
Clark's.....	33&5%
Tapes, Measuring—	
American.....	25&10%
Spring.....	40%
Chesterman's, Regular list.....	25&30%
Thermometers—	
Tin Case.....	80&80&10%
Thimble Skins—See Skins.	
Ties, Bale—Steel	
Standard Wire, list.....	50&10&5%
Tinners' Shears, &c.—	
Shears and Snips (P. S. & W.).....	20&25%
Snips, see Pincches.	
Snips, J. Mallinson & Co.....	33&5%
Tinware—	
Stamped, Japanned and Piced, list Jan. 20, 1887.....	70&10&70&10&5%
Tire Benders, Upsetters, &c.—	
Stoddard's Lightning Tire Upsetters.....	15%
Detroit Perfected Tire Bender.....	15%
Tobacco Cutters—	
Enterprise Mfg. Co. (Champion).....	20&10%
Wood Bottom.....	50¢
All Iron.....	50¢
Nashua Lock Co's.....	50¢
Wilson's.....	50¢
Sargent's.....	50¢
Acme.....	50¢
Transom Lifters—	
Wollensak's Class 3 and 4, Bronzed Iron.....	50%
Class 3 and 4, Bronze Metal.....	50%
Class 3 and 4, Brass.....	50%
Skylight Lifters.....	50%
Crown, Eagle and Shield.....	50%
Rehner's Bronzed Iron Rods, list Jan. 1, 1887.....	50&25%
Rehner's Real Bronze or Nickel Plate.....	50&25%
Excelsior.....	50&10&25%
Shaw's.....	50&10%
Payson's Universal.....	40&10&10%
Traps—	
Game—	
Newhouse.....	75¢
Onelida Pattern.....	30¢
Game, Blake's Patent.....	40&10&5%
Mouse and Rat—	
Mouse Wood Choker, 7 doz holes, 11&12¢	
Mouse, Round Wire.....	50¢
Mouse, Catch-em-alive.....	50¢
Mouse, "Bonanza".....	50¢
Mouse Delusion.....	50¢
Rat, "Decoy".....	50¢
Ideal.....	50¢
Cyclone.....	50¢
Hotchkiss Metallic Mouse, 5-hole traps.....	50¢
In full cases.....	50¢
Trowels—	
Lothrop's Brick and Plastering.....	25%
Reese's Brick and Plastering.....	25%
Dixon's B'r and Plastering.....	25%
Peace's Plastering.....	25%
Clement & Maynard's.....	25%
Rose's Brick.....	15&20%
Brade's Brick.....	25%
Worral's Brick and Plastering.....	20%
Garden.....	70%
Triers—	
Butter and cheese.....	25%
Trucks, Warehouse, &c.—	
B. & L. Block Co.'s list, '82.....	40%
Tubes, Boiler—	
See Pipe.	
Twine—	
Flax Twine.....	BC. B.
No. 9, 1/4 and 1/2 B Balls.....	25¢
No. 12, 1/4 and 1/2 B Balls.....	21¢
No. 18, 1/4 and 1/2 B Balls.....	18¢
No. 24, 1/4 and 1/2 B Balls.....	18¢
No. 30, 1/4 and 1/2 B Balls.....	10¢
No. 28, 1/4 and 1/2 B Balls.....	48¢
Chalk Line, Cotton Wire.....	25¢
Mason Line, Linen.....	50¢
2-Ply Hemp, 1/4 and 1/2 B Balls (Spring Twine).....	11¢
3-Ply Hemp, 1/4 B Balls.....	12¢
3-Ply Hemp, 1/2 B Balls.....	11¢
Cotton Wrapping, 5 Balls to lb.....	15¢
2, 3, 4 and 5-Ply Jute, 1/4 B Balls.....	10¢
Paper.....	6¢
Cotton Mops, 6, 9, 12 and 15 lb to doz.....	15¢
Vises—	
Solid Box.....	50¢
Parallel—	
Fisher & Norris Double Screw.....	15&10%
Stephens.....	25&30%

Parker's.....	20&25%
Wilson's.....	50%
Howard's.....	40%
Bonney's.....	40&10%
Millers Falls.....	40&10&10%
Trenton.....	40&5&40&10%
Merrill's.....	15&20%
Sargent's.....	60&10&10%
Backus and Union.....	40%
Double Screw Leg.....	15&10%
Frontis.....	20&5&25%
Simpson's Adjustable.....	40%
Saw Fliers—	
Bonney's, Nos. 2 & 3.....	50¢
Stearns.....	33&10&33&10&10%
Stearns' Silent Saw Vises.....	33&10&33&10&10%
Sargent's.....	60&10%
Hopkins.....	50¢
Reading.....	40&10%
Westworth.....	20&10%
Combination Hand Vises.....	50¢
Cowell Hand Vises.....	20%
Bauer's Pipe Vises.....	10%
Wagon Boxes—	
Per doz.....	24¢
Wagon Jacks—	
Daisy.....	50¢
Washer Cutters—	
Smith's Pat. 7 doz \$12.00, dis 20&10&10%	
Johnson's.....	50¢
Penny's.....	50¢
7 doz Pol. \$14; Jap'd, \$16.00, dis 50%	
Appleton's.....	50¢
Bonney's.....	50¢
Washers—	
Size.....	1/4 5-16 3/8 1/2 5/8 3/4 1
Washers.....	7 5/4 4 3/4 3 3/4 3 1/4 3 1/4
In lots less than 200 lb, 5¢ lb, add 1/4¢, 5-b boxes 1¢ to list.	
Wedges—	
Iron.....	50¢
Steel.....	50¢
Well Buckets, Galvanized—	
Hill's.....	50¢
Iron Clad.....	50¢
Whiting's Flat Iron Band.....	50¢
Whiting's Wire Top.....	50¢
Well Wheels—	
8 in., \$2.25; 10 in., \$2.70; 12 in., \$3.25.	
Wire—	
Iron.....	50¢
Market, Br. & Ann., Nos. 0 to 18.....	70&10&70%
Market, Cop'd, Nos. 0 to 18.....	70&10&70%
Market, Galv., Nos. 0 to 18.....	65&25%
Market, Tin'd, list Nos. 0 to 18.....	60%
Stone, Br. and Ann'd, Nos. 16 to 18.....	75¢
Stone, Bright and Ann'd, Nos. 19 to 25.....	72¢
Stone, Br. and Ann'd, Nos. 27 to 30.....	75¢
Stone, Tinned.....	70¢
Tinned Broom Wire.....	70&5&70&10%
Galvanized Fence.....	65%
Annealed Fence, Nos. 8 and 9.....	70%
Annealed Grape, Nos. 10 to 14.....	70%
Brass, list Jan. 18, 1884.....	15&20%
Copper, list Jan. 18, 1884.....	25%
Barb Fence.....	See Trade Report
Wire on spools.....	60%
Mallin's Steel and Tin'd Wire on Spools.....	40%
Mallin's Brass and Cop. Wire on Spools.....	30%
Cast Steel Wire.....	50%
Stub's Steel Wire.....	60¢
Steel Music Wire, Nos. 12 to 30.....	50¢
Picture Wire.....	60¢
Barb Wire Safety Guard.....	10¢
Wire Clothes Lines, see Lines.	
Wire Cloth, Netting, &c.—	
Painted Screen Cloth, No. 34.....	1000 sq. ft. \$1.90
Painted Screen Cloth, No. 33.....	100 sq. ft. \$2

THE IRON AGE

THURSDAY, JANUARY 10, 1889.

Pea Coal for Elevated Railroad Locomotives.

Commenting on the recent attempt to use pea coal on the elevated railroad locomotives in New York, the *National Car and Locomotive Builder* says:

The locomotives used on the elevated railroads of New York have always burned a good quality of egg anthracite coal, and the small engines have never had much margin of steaming capacity for the heavy work they are required to do. Knowing this from intimate acquaintance with the performance of the engines, we were very much surprised lately to hear that it was the intention of the officers of the road to begin burning pea coal in the fire-boxes of the engines. A single engine was tried first, and with a great deal of favoring she was kept running, and this very meager measure of success was deemed sufficient

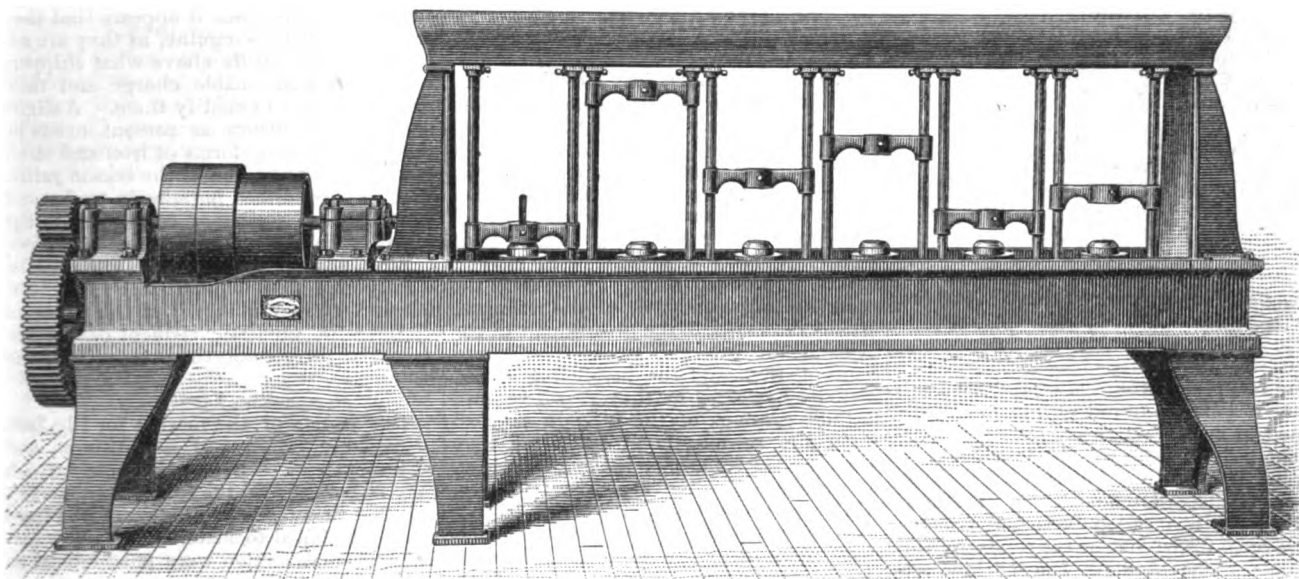
elevated railroads. Slack coal entails slow combustion per foot of grate area and the use of a thin fire. Frequent starting from stations is fatal to the use of a thin fire, for the strong exhaust tears holes in the fire, consequently service like what has to be performed on the elevated railroads is the least adapted for the use of the inferior fuel. Considerations of this kind ought to prevent the officers of any railroad operating trains that stop frequently from trying experiments with fine coal, and the elevated railroads of New York ought to be the last to try anything of the kind, for when everything is done to favor the engines there is too small margin for bad weather and the numerous other exigencies that are ever arising to impair the regularity of trains. Moreover, the Elevated Railroad Company, of New York, have no right to try experiments which are calculated to derange the regularity of trains, causing delay to the public and incurring

must be thrown back 11 years, and the credit of the first construction awarded to Galileo.

Stay Bolt Threading and Tapping Machine.

Messrs. Nicholson & Waterman, of Providence, R. I., a short time since designed and built a simple form of stay bolt threading and tapping machine specially intended as a railroad shop tool. The engravings which we give of it in this issue explain its principal features.

The large number of stay bolts used in a locomotive boiler, the importance of having them fit and the difficulty in getting uniformity especially when following taps has made the need of this machine apparent. The principle of operation consists in running dies at a slow rate of speed, well supplied with oil and in getting the



STAY BOLT THREADING AND TAPPING MACHINE, BUILT BY NICHOLSON & WATERMAN, PROVIDENCE, R. I.

excuse for supplying that kind of fuel to a dozen or more of the engines as a preliminary to putting the whole equipment on pea coal. But the experiment on a large scale, which put each engine on her own merits, soon demonstrated what burning fine coal in small fire-boxes really meant. For the day it was tried the train service on the Third avenue line was very seriously crippled. The engines lost time so badly for want of steam that intervals as long as 30 minutes occurred between trains, which entailed a vast amount of inconvenience upon the people of New York City who are dependent upon these roads for prompt and regular transit.

Any one who is at all familiar with the combustion of anthracite coal, and has reflected on the conditions necessary to its use, must have been aware that it could not be successfully burned on the limited grate area found in the elevated railroad locomotives. We do not believe that there is a single locomotive in the country burning pea coal pulling passenger trains that stop and start frequently, even in fire-boxes like the Wooten, that are specially designed for small coal, and it was pure insanity to pretend that it could be done in small fire-boxes of engines doing the hard work performed by the locomotives on the

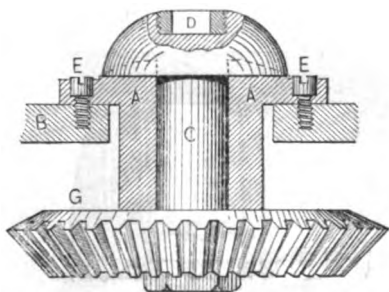
unusual risks of accident. At some times of the day the train service is very much behind the demands for accommodation, and the attempt to save a few dollars at the expense of making intolerable blanks between trains is simply trifling with the needs and rights of a vast multitude of people.

M. Govi, an Italian savant, has presented a paper to the French Academy of Sciences, in which he claims for Galileo the distinction of having discovered the microscope, as well as the telescope. He has found a book printed in 1610, according to which Galileo had already directed his tube fitted with lenses to the observation of small near objects. The philosopher himself stated, shortly after this date, that he had been able to observe through a lens the movements of minute animals and their organs of sense. In a letter, written in 1614 to a Signor Tarde, he states that he has with his microscope "seen and observed flies as large as sheep, and how their bodies were covered with hairs, and they had sharp claws." The date usually assigned to the discovery of the microscope is 1621, and the invention is attributed to Cornelius Drebbel, a Dutchman; but according to M. Govi the date

greatest economy by multiplying the number of dies at work. By slow speed the best service is obtained from the die, and ample time is allowed for testing and adjusting whatever change in size may come from wear. A great difficulty experienced by locomotive boiler builders arises from the rapid wear of the taps used in threading for stay bolts, and the consequent change in size. As usually equipped the threading machinery must get several days ahead of boiler work and the change in size of tap becomes very difficult to follow. The Nicholson & Waterman machines now in operation seem to have entirely overcome these difficulties.

In detail, the machine consists of a bed, at one end of which is placed a short shaft having two pulleys and a bronze pinion communicating motion to a large gear, which in turn drives through pairs of bevel gears a number of upright spindles. There are six of these and they are all duplicates of one another. An enlarged view of one of these spindles with its bevel gear G attached is shown in Fig. 2. The top of each spindle C is made to receive the hardened head-holder D, which is made to suit the size of the head of the bolt. The under side of the head of the spindle is cupped to secure a tight joint under wear

and prevent the oil from leaking through. A sleeve, A, holds the spindle and is adjusted in line and held in place by screws, E, and pins. To the bottom of the spindle is securely keyed the larger of the bevel gears. This gear is of cast-iron, and its driver of bronze. All the teeth are cut in order to secure the most perfect and smooth feed. Projecting from the top of the bed and on either side of each spindle are two rods used to guide the die holder. They are fastened at their upper ends by set screws and holes through the oil tank. The tap is shaped to form a holder for oil, which is fed upon the work from pet cocks over each die. The oil runs into a tank under the machine from which it is pumped into the upper feed tank by a rotary pump driven from the countershaft. An overflow pipe prevents the upper tank from getting too full. The die holders slide loosely upon the rods, and the operation of the machine consists in placing the head of a stay bolt in the socket D, which is constantly in motion and pressing the die on the end of bolt. The die once started feeds itself along until it reaches the socket D, where, continuing to feed, it draws the head of bolt out and the oper-



Stay Bolt Threading and Tapping Machine.
—Fig. 2.—Detail of Bolt Spindle.

ation removes it from the tap. The form of die used is the round split solid die adjusted by set screws.

The machine is changed into a nut tapper by substituting for the die holders receivers adapted to nut blanks. The head of the tap is inserted in D, and remains there until drawn out by the tap being full of nuts. The height of the machine admits of stay bolts being threaded of single or multiple lengths.

The question of brakes for locomotive engine trucks is a live one, in view of the attempted introduction of large eight-wheel locomotives for fast passenger service, having 40,000 pounds and over upon their trucks. In the present designs of such engines, this is an unbraked weight, and gives rise to excessive strains on the draw bars of the first few cars of the train, and also increases the length of both the service and the emergency stops.

Electricity and Artesian Wells.—The discharge of water from artesian wells has for many years been employed as a motive power in France. In the city of Tours there is an artesian well which drives a hydraulic wheel 7 m. in diameter and works the machinery of a silk factory. At Grenelle the heat of the water issuing from a deep well is utilized in warming buildings. A project is now before a Commission of the Municipal Council of Paris having for its aim the utilization of the power obtainable from the new artesian well in the Place Hébert, at La Chapelle. There are now three important artesian wells in the Paris basin, that of Grenelle being the oldest, and that at Passy the most productive. The new La Chapelle well is particularly adapted for the experiment of producing motive power.

Besides these there are a number of private artesian wells in Paris belonging to manufacturers. The La Chapelle well was finished in March last, having been begun 24 years ago. It reaches a depth of 720 m., and the water, left to itself, rises to a height of 35 m. above the mouth. It furnishes 6000 c. m. of water in 24 hours. The proposal is to utilize the power furnished by the well in generating and distributing electricity for lighting and motive purposes. One object mentioned is the lighting of the park of the Buttes Chaumont, which is situated near the well. Before now electricity has been generated in this manner. At Ponce de Leon, in Florida, there is a hotel having a powerful artesian well which drives a turbine-wheel and dynamo, thus generating the current necessary to light the building and its grounds. At Yankton, in Dakota, there is a flowing well which drives the dynamos of an electric light company. The well is 600 feet deep, and the water on issuing from it is conducted to a reservoir placed 30 feet above the turbine which actuates the dynamos.

THE CHICAGO IRON TRADE.

ITS HISTORY IN 1888.

The year which has just closed was one of peculiar experiences to members of the iron trade. It was a period of vacillation from oppressive quietude to very great activity and of fluctuations in price often bewildering to buyers and sellers by the abrupt changes made. Disturbing influences were numerous and potent, some of a general character and others local in their nature. Principal among these stood the unsatisfactory condition of the railroads, usually the source of the greater part of the demand for iron and steel. The scanty crops of 1887, and the paralleling of old road by new ones in that year decreased the net earnings of the Western railroad companies so heavily in 1888 that they were forced to economize in every way, in purchasing even necessary supplies, while new railroad enterprises halted, with a depressing effect on manufacturers dependent to a great extent on the demand from that source. Early in the year, however, a noticeable activity prevailed among carbuilders who were called upon to equip the new lines of road built in 1887, but such a demand naturally exhausted itself in a few months. The freight war in the Northwest, which involved a number of the most important railroad systems in the country, decreasing their earnings and curtailing their purchasing power; the Chicago, Burlington and Quincy engineers' strike, which lasted for many weeks and affected an important section of the West; legislation hostile to railroads in some of the Western States, which was brought upon them through their own acts, yet was both directly and indirectly injurious to railroad investments; wars between great East and West through lines, which resulted in the establishment of unremunerative rates on freight and passenger service—all had their effect in decreasing the consumption of iron and steel and reducing prices. The builders of Chicago suffered to some extent from the effect of the great 8-hour strike in 1887, of which capitalists feared a repetition in some degree in 1888 and were chary about beginning new enterprises. Hence, the local architectural iron works found their capacity but partly engaged during the building season, decreasing the consumption of iron quite noticeably. The dispute over the annual adjustment of rolling-mill wages scheduled in July was expected to prove a very serious matter, but it was a veritable blessing in disguise, as the

stoppage of the Western mills for a month relieved the market of a plethora of finished iron, while their unlooked-for resumption started a sudden demand for raw material which advanced the price of pig iron and old rails and sustained the market in good shape for at least a quarter of the year. Tariff agitation in Congress and the Presidential election had their effect on business in the Northwest in common with other parts of the country. The last two months of the year were unproductive of disquieting influences, but, on the contrary, witnessed a condition of affairs which if continued will lead to much better business and possibly a restoration of activity. The closing in of winter was so gradual that no crops were injured by frost except in a very small section of the extreme Northwest, while the crop of corn garnered in the great corn-growing belt was never equaled in any former season, thus assuring prosperity to farmers and business to the railroads. Already the influence of the excellent crops has been felt in the demand for cars, and car-builders are again finding their order books filling up, some of them, in fact, now running to their full capacity. Managers of railroads are now more hopeful of their ability to sustain rates, in view of the traffic passing over their lines, though in some cases it appears that they are somewhat too sanguine, as they are advancing their tariffs above what shippers regard as a reasonable charge and they may be obliged to modify them. A slight downward tendency at present exists in the prices of many forms of iron and steel, but it is felt to be due to the season rather than any confirmed impulse in trade, and everywhere a feeling of confidence in the future is manifested. It would be a piece of unwisdom to suppose that 1889 will be wholly free from demoralizing influences, but a very careful survey of the situation discloses no domestic element of disturbance now threatening the prosperity of the country.

Pig Iron.

The course of the market for Pig Iron disclosed a number of new things and reaffirmed some old ones, among which may be enumerated the following:

1. The threatened inundation of iron from the South failed to materialize. New furnaces in that section were put in blast so gradually that their product was absorbed without seriously affecting prices. It is reported on very good authority that quite a number of the leading Southern companies now have contracts on their books covering 50 per cent of this year's product.

2. In defiance of previous experience, the steel-rail trade does not always rule the iron trade generally. Prices of pig iron and of other iron advanced quite independently of steel rails in August, September and October.

3. When the demand improves prices advance without regard to stocks in maker's hands. Pig iron seems to be as sensitive to trade influences as the needle is to the magnetic current. The impulse in one direction or another sways it almost instantly without regard to statistics of stocks.

4. Declarations by makers that cost cannot be forced any lower do not check a downward tendency in prices. Supply and demand regulate prices in the main when they are not artificially affected by combinations, and protests by individual makers against a further decline, because actual cost has been reached, are without influence on the market.

5. Chicago prices during the past year were largely independent of the influences existing in other markets. Bessemer pig iron sold at as low a price as anywhere in the country, and coke foundry pig iron as low as, if not lower, than in any other Northern market. The course of

prices of leading varieties of iron during the year is shown in the following table of monthly averages, terms cash, f.o.b. Chicago:

Months.	Lake Superior Charcoal.	Lake Superior Coke No. 1.	Am. Scotch (Backband) No. 1.	Southern Coke No. 2 (From October No. 1).
January.....	\$22.00	\$19.50	\$20.50	\$19.50
February.....	21.50	19.25	20.50	19.00
March.....	21.00	18.50	20.25	18.50
April.....	20.50	18.50	20.00	18.00
May.....	20.00	18.00	19.50	17.50
June.....	19.50	17.50	19.00	17.50
July.....	18.50	17.00	18.25	16.50
August.....	19.00	17.00	18.25	17.00
September.....	19.50	17.50	18.75	17.75
October.....	19.75	18.00	20.00	17.75
November.....	20.00	18.00	20.00	17.50
December.....	20.00	17.50	19.50	17.00

The lowest reported sale in Coke Iron for the year occurred in July, when a quantity of Lake Superior Mill and of Southern Mill brought \$14, cash. The lowest reported sale of Bessemer Pig Iron was at \$16.60, cash, f.o.b. Chicago. Ordinarily, the price of Bessemer Pig Iron is about the same as of Lake Superior Coke. An event which attracted some attention at the time was the sale in July of 600 tons of Lake Superior Charcoal Pig Iron for export to England to be used in the manufacture of Malleable Castings.

Finished Iron.

Prices of Bars, Plates, Sheets and Angles fluctuated remarkably. In the summer months Bars and Sheets were unduly depressed, touching prices from which a rapid recovery was effected. Contracts for mill lots of Common Bars were placed in August as low as 1.50¢, half extras, f.o.b. Chicago, while No. 27 Sheet Iron, Common Black, was sold at 2.80¢ in May and June. In the last four months of the year, Bar Iron has ruled very steadily at about 1.70¢ @ 1.75¢, with some sales at 1.80¢. An excited condition of the Sheet-Iron trade prevailed from July to October, arising from the failure of the Aurora (Ind.) mill, which had taken a large number of contracts at low prices that had to be transferred to other mills already well supplied with work, and also caused by a heavier demand for Light Sheets from several classes of consumers than had been anticipated when season contracts were placed in June and July. The stoppage of many mills in July, as above referred to, also had its effect in stiffening the views of manufacturers. The course of prices during the year on mill lots of Common Bar Iron, Angles, and No. 27 Sheet Iron, is indicated in the following table of monthly averages, f.o.b. Chicago:

Months.	Common Bars.	Angles.	No. 27 Sheets.
January.....	1.75¢	2.35¢	3.05¢
February.....	1.72	2.35	3.00
March.....	1.70	2.30	3.00
April.....	1.70	2.25	2.95
May.....	1.62½	2.25	2.85
June.....	1.60	2.20	2.85
July.....	1.60	2.15	2.90
August.....	1.65	2.25	2.95
September.....	1.75	2.30	3.15
October.....	1.75	2.30	3.10
November.....	1.72½	2.17½	3.10
December.....	1.72½	2.15	3.05

Steel Rails.

Chicago being the Steel Rail City, the slack demand for this class of railroad material was severely felt in 1888. The mills ran but for a part of the year, and one of the North Chicago Rolling Mill Company's Rail mills was diverted to the manufacture of beams. The production of steel rails by the Chicago mills was nevertheless quite large, amounting to 419,850 gross tons in the year. An event of some importance in the tech-

nical history of 1888 was the successful introduction of the use of oil for fuel in these works, a regular supply being assured by the completion of a pipe line from the Lima (Ohio) oil field to Chicago. The course of the local steel rail trade during the year is well indicated by the following table of monthly prices:

Jan....	\$35.00	May....	\$32.50	Sept....	\$30.00
Feb....	34.50	June....	32.00	Oct....	29.00
March..	33.50	July....	31.50	Nov....	29.00
April..	33.00	Aug....	30.50	Dec....	30.00

The lowest steel rail contract known to have been taken in Chicago during the extreme depression of October and November netted the mill probably \$27.50. The present price is \$30, and it seems very probable that it can be sustained if not advanced.

Old Material.

The price of old iron rails declined in sympathy with the finished product until July, when the unexpected starting of the Western mills precipitated a demand which so hardened prices that a very material advance was made in August. This caused considerable speculation in old rails and led to very active trading, limited only by the short supply and the speedy absorption of visible stocks for consumption. Other old material sympathized. The advance was not held, however, and prices are now lower, but not so low as in May and June, in the depth of the depression. The course of prices was as follows in the leading classes of old iron by months:

Months.	Rails.	No. 1 Forge.	No. 1 Mill.	Cast.
January.....	\$21.00	\$21.00	\$18.00	\$18.00
February.....	22.00	21.00	16.00	16.00
March.....	21.00	20.50	15.50	16.00
April.....	20.50	19.50	14.00	15.00
May.....	20.00	18.50	13.50	14.00
June.....	18.00	17.50	12.50	13.00
July.....	19.00	16.50	12.00	12.00
August.....	23.00	17.00	13.50	13.50
September.....	25.00	19.50	15.50	14.00
October.....	24.00	20.50	16.00	14.50
November.....	23.00	20.50	15.50	14.50
December.....	22.50	20.50	15.50	13.50

In the above table old rails are quoted per gross ton, and the other classes of iron per ton of 2000 pounds.

Merchant Steel.

Prices were sustained, with but slight variation, from the beginning of the year to nearly the close of October, on all the leading and higher-priced grades of Steel. The only episodes worthy of note in that entire period were the contracts for season's supplies by manufacturing consumers, which made the market more active at some times than at others. In October, however, a change occurred in the situation, and a break was made in the price of Open-Hearth Spring Steel, which had been steadily held at 2.90¢. Through the competition of several prominent manufacturers the price was cut to 2.50¢ @ 2.60¢, and large orders were taken at 2.35¢ @ 2.40¢. Machinery Steel suffered in sympathy, Open-Hearth dropping to 2.40¢, although some manufacturers resisted the decline and maintained their quotations steadily at 2.75¢ @ 3¢. The prices of leading qualities of Steel which were maintained throughout the whole year are as follows: Tool Steel, 8.50¢ @ 9.50¢; Specials, 13¢ @ 25¢; Crucible Sheet Steel, 7¢ @ 10¢. At the close of the year the prices of other qualities which had suffered fluctuations as above described were as follows: Crucible Spring, 3.75¢; Open-Hearth Spring, 2.50¢; Open-Hearth Machinery, 2.40¢ @ 2.75¢.

Barb Wire.

The year opened most auspiciously for the manufacturers of Barb Wire. They had succeeded in controlling the trade by refusing to sell large quantities for future

delivery, and when the usual demand for the spring appeared, they at once realized the benefit of their policy through the advance in prices which took place naturally, and not through any artificial means. The effect of this continued to be felt for almost the entire first half of the year. Foreseeing the depression which would ensue from the usual midsummer dullness, the leading manufacturers endeavored to secure a general decrease of production in July and August, but this plan was not properly supported, and predictions were quite freely made that in consequence of the large unmarketed production prices would be ruinously low before the close of the year. An attempt was made in September and October to avert this by the organization of the manufacturers into a pool, but this scheme met with no greater success than previous efforts of the kind, and competition proceeded unrestricted. In November and December large contracts were made for the sale of Barb Wire to the merchants, some of them understood to run up to May. The prices realized are said to be the lowest made in the history of the trade, the year closing with the manufacturers asking 2.75¢ for large lots of Painted. Manufacturers' prices for Painted during the year have ranged about as follows:

Jan....	3.25¢	May....	3.05¢	Sept....	2.80¢
Feb....	3.10	June....	3	Oct....	2.75
Mar....	3.15	July....	3	Nov....	2.75
April... 3.12½		Aug....	2.90	Dec....	2.75

Nails.

In both Steel-Cut and Wire Nails the trade of the past year was unsatisfactory as to price, though in volume it was nearly up to the average for Cut Nails, while Wire Nails scored a handsome increase over previous years. Efforts were made by the manufacturers to work the price of Nails up to a remunerative basis through combinations. The Cut-Nail manufacturers did not succeed in their plans in this respect until nearly the close of the year, when they perfected an organization which has thus far shown decided strength and which will be of great benefit to them if its details are faithfully carried out. The Wire-Nail manufacturers effected a combination in August, but it was disrupted in December just about the time that stocks bought by jobbers at low prices were being exhausted and manufacturers could reasonably expect to reap the fruit of their new arrangement. Very heavy sales were then made to jobbers at lower prices than prevailed before the combination was formed, and the activity prevails up to this time. A disturbing influence in the Western nail trade was the freight war which prevailed in March and April between railroads running to Missouri River points and was the direct cause of inducing the jobbers of that section to stock up heavily on both cut and wire nails, which they were unable to dispose of for several months following, thus depressing prices in an important part of the country for a very considerable period. At present the cut nail trade is in very good condition, prices are being firmly sustained at the rate fixed by the manufacturers' association, and the possibilities are strongly in favor of small advance in the manufacture. The course of manufacturers' prices at Chicago for large lots of steel cut and wire nails was as follows during the year:

Months.	Steel.	Wire.
January.....	\$2.05	\$2.70
February.....	2.05	2.60
March.....	2.15	2.65
April.....	2.05	2.70
May.....	1.95	2.60
June.....	1.85	2.50
July.....	1.85	2.35
August.....	1.90	2.45
September.....	1.85	2.55
October.....	1.90	2.55
November.....	1.80	2.55
December.....	1.90	2.40

The Flat Top Coke Trust.

It has been a continual mystery to Connellsville coke producers, says the Pittsburgh *Times*, why coke made in the Flat Top region of Virginia and West Virginia usually commands higher prices in the Southern and Western markets. Flat Top coke has never sold for less than \$1.75 per ton, and when Connellsville coke was quoted at from 90 cents to \$1 per ton the Flat Top coke still continued in the market at \$1.75 to \$2. To solve this mystery a member of the Coke Producers' Association went down to Flat Top, and this is his report:

The Flat Top coke is in the hands of a trust, and there is absolutely no competition between producers. The 14 coal and coke companies now operating in the region are working on leased property owned by two land companies. Formerly the field was operated under leases made by the Southwest Virginia Improvement Company, the Bluestone Coal Company, the Flat Top Coal Company, Crane Creek Coal Company, &c. Last month these companies became absorbed into one organization, under the title of the Flat Top Land Trust, with the following officers: President, E. W. Clark; vice-president, S. F. Taylor; secretary and treasurer, C. M. Clark; general manager, C. H. Duhring. This company propose to move their offices to Pittsburgh and enter into competition with the Connellsville field. They own 10,000 acres in Tazewell County, Va.; 50,000 acres in Mercer County, W. Va.; 65,000 acres in McDowell County, W. Va., and over 100,000 acres in Wyoming County, W. Va., in which no leases have yet been made. The other company is the Crozer Land Company, who control 12,000 acres on Lower Elkhorn. These companies now employ a mine inspector to see that no coal is unnecessarily lost, and by a recent provision require that all lessees of their property build 100 coke ovens. The Pocahontas Coal Company sell the entire product of the Flat Top coal field. In 1887 their shipments were 1,025,880 tons; for 1888 they were about 1,250,000, and expect in 1889 to ship fully 2,000,000 tons. From 50 to 60 cars of coke now leave the region daily, but when the new ovens are completed in May, the trust expect to go into the market with fully 1000 cars per week, or about one-sixth of the Connellsville output. They claim that an analysis of their coke shows 3 per cent. more carbon or heat molecules than does the Connellsville article, and they will eventually drive the latter from the Southern market.

The Mining Engineers.—The fifty-third meeting of the Institute of Mining Engineers will be held in this city, beginning Tuesday evening, February 19, with an open session, to be followed on Wednesday by an excursion to the Spiral Weld Tube Works and the Edison Laboratory, at East Orange, N. J. At the latter place a special session will be held, devoted to the discussion of the applications of electricity in mining, R. P. Rothwell, editor of the *Engineering and Mining Journal*, having special charge of the programme of this session. The evening will be given over to papers and discussions connected with iron and steel; members intending to present papers on these subjects being asked to correspond with Charles Kirchhoff, Jr., editor of *The Iron Age*; the secretary, Dr. R. W. Raymond, requesting that members notify him of their intention to take part in the discussions. Thursday is set aside for sessions, there being a subscription dinner in the evening. Friday is to be devoted to local excursions, and the evening to a social reception, while on Saturday an opportunity will be given to visit the different works in this vicinity.

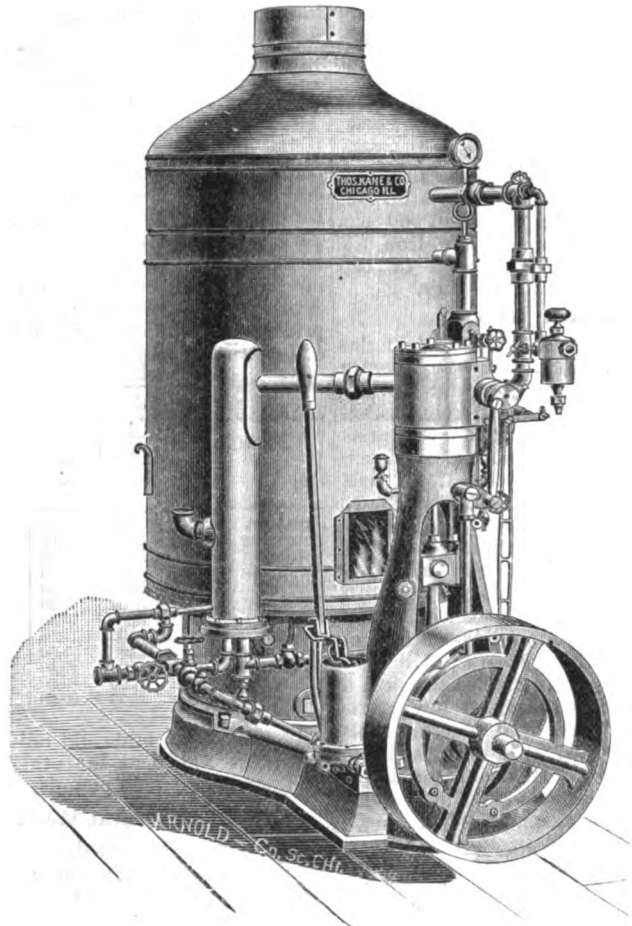
The *Tariff League Bulletin* was issued for the first time last week as the *American Economist*, "the idea being to broaden its scope, and the ultimate aim to establish it firmly as the leading weekly journal advocating the American system of economies." It is the purpose of the American Protective Tariff League to strengthen the *American Economist* in many respects during the present year.

The Durant-Kane Automatic Engine and Boiler.

Messrs. Thos. Kane & Co., 137 and 139 Wabash avenue, Chicago, Ill., are putting on the market a compact power outfit, of which we annex an engraving. It embraces several features of interest, the most noteworthy feature being its special adaptation to the use of oil as fuel.

The boiler is what is known as the Durant porcupine, the general design of which is not unknown. It consists of a main central upright column, with welded ends, and with a fire tube in the center. Arms with smaller pipes radiate from it. The steam is run through a superheater before going to the engine. A drain pipe

connection rod. The connection rod is of steel, with brass boxes. The main valve is of the rocking type, and balanced. The motion of the valve is obtained by an intermediate rocker-arm which brings all the work and strain in a straight line with the center of the crank shaft. By the use of the rock shaft the motion is short, enabling the engine to run at a high rate of speed without strain or jar. The piston is hollow and has snap packing rings which are turned larger than the diameter of the cylinder, then split and sprung together and turned the same diameter as the cylinder, making a perfect fit at once. They are self-adjusting, tight, yet free in their action. The piston rod and cross-head pin are steel. All wearing parts of this engine are made adjustable to wear.



AUTOMATIC ENGINE AND BOILER, BUILT BY THOS. KANE & CO., CHICAGO, ILL.

returns any water carried into the superheater to the base of the boiler. The pipes are of the best quality charcoal lap-welded wrought iron type, tested to 400 pounds hydraulic pressure. An exhaust steam heater is used to heat the feed water. A pump is employed for feeding.

Ordinary kerosene of from 110 to 150 test is used, though cheaper grades can be satisfactorily burned. Crude petroleum also is available, the burners being fitted for either. The oil is drawn from a tank and passes to a trap near the boiler, from which it cannot escape unless drawn out by some pressure; it then passes through a strainer and is conveyed to an atomizer, where it is atomized by a jet of superheated steam.

The engine is a double crank vertical engine. There are two bearings for the crank shaft which are cast solid with the frame, and are long and large in diameter. The cross-head slides are also cast solid with the frame. The crank is of steel, and is balanced against one-half of coun-

The engine is made in sizes ranging from 2 to 12 horse-power. The outfit is adapted also for marine use, in which its compactness and the convenience of operating readily commend it. We understand that for more than a year a plant of 150 16 candle-power lights has been run by one of these outfits, the engine used being a 6 x 6 cylinder, run at a speed of 508 revolutions, cutting off at 1-6 stroke and belted direct to the dynamo.

Early Coal-Burning Locomotives.—The *National Car and Locomotive Builder*, says Mr. William Buchanan, superintendent of the motive power of the New York Central Railroad, who is the inventor of one of the most successful soft-coal burning fire-boxes ever applied to a locomotive, is particularly well acquainted with all the experiments made in this country and in Europe by railroad men and other inventors who have labored to produce a furnace perfectly adapted for the economi-

cal combustion of bituminous coal. The old Hudson River Railroad Company, with which Mr. Buchanan was connected, applied to their locomotives many of the so-called improvements designed for the purpose of burning soft coal properly. Among other devices, the combustion chamber was tried in numerous forms. It was tried from 1 foot to 5 feet long. Large flues and flues as small as 1½ inches were tried with it. Brick arches were applied in various forms to protect the chamber, and various methods were adopted to mix air with the gases in the combustion chamber, and nothing that skill directed by zealous intelligence could do to make the device a success was spared. But it all availed nothing. It was found that the plain fire-box did as well as the fire-box with a combustion chamber, and most of the engines did better when the combustion chamber was abolished and flues put in place of it. Mr. Buchanan applied a brick arch to one of the engines as early as 1857; but he used common fire-brick and the arch did not stand well.

The State of the Navy.

The year 1889 will be an important one in the history of the new navy of the United States. The trials and experiments of the great cruisers Baltimore, Chicago and Charleston, to say nothing of the gunboat Yorktown and the dynamite cruiser Vesuvius, will keep the public at large more cognizant of the developments in the naval establishment than did the announcement in the year past regarding the progress of the work on these new vessels. During the year 1888 the great shipbuilding yards of Cramp & Son, at Philadelphia, the Union Iron Works, of San Francisco, and the Columbia Iron Works, of Baltimore, have been rushing to completion the work of construction on the war vessels in their charge. On April 28 the Cramps successfully launched the dynamite cruiser Vesuvius and the gunboat Yorktown; on the last Thursday in July the Charleston was slipped from the ways of the Union Iron Works, and in September following the powerful cruiser Baltimore was added to the list of vessels launched by the Cramps, of Philadelphia. In the Government yards at Norfolk and Brooklyn the work of construction has been, with a few exceptions, uninterrupted on the new battle ships Texas and Maine, and in those private yards throughout the country where contracts for war vessels have been awarded the work is being rapidly pushed ahead. The association of old wooden craft and battered hulks with all pertaining to our navy has been so common with a large class of people that to them the rapid changes made of late in the type of vessels and style of armament are wholly incomprehensible. That the navy of the United States is making rapid strides toward the front rank of armed forces on the sea is undeniable, and if Congress will but exhibit the same spirit of liberality shown in its appropriations of the last four sessions the supremacy of the navy will result in a comparatively short space of time.

It may not be without interest here to again present a list of the vessels of the new navy. The list has been published at different times, but will well bear repetition. The unarmored vessels, with their armament, tonnage and power are detailed in Table I.

In the list of armored vessels we have the vessels mentioned in Table II.

To compare the vessels of the new navy, as given in the above, with those of other countries, it may be interesting to know that of the 19-knot war ships of 3000 tons and upward Great Britain has 10, the United States, 8; France, 5; Spain, 3;

Japan, 2, and Russia, 1. In this summary the position of the United States is second, and considering the short growth of the new navy, the above standard is very high.

During the past year the fastest, largest and most powerful protected cruisers yet laid down are the Blake and the Blenheim, of the English service. The displacement of these vessels is 9000 tons each, the indicated horse-power, 20,000; trial speed, 22 knots, with a continuous sea speed of 20 knots. These vessels have heavy, protective decks, ranging from 4 to 6 inches in maximum thickness. The Piemonte, of the Italian navy, is the fastest cruiser built during the year just past. Sir William Armstrong & Co. were the builders, and she was bought from the Armstrongs by the Italians. Her displacement is about 2500 tons, and it is expected, with

could be driven through 15½ inches of iron if propelled by this description of powder. As it is, a projectile from the 6-inch breech-loading rifle, when propelled by the regulation American powder, pierces 12 inches of iron. Experiments are in process to obtain a higher grade of powder, and when found the efficiency of the guns will be proportionally increased by its use.

Connellsville Coke Wages.

After holding numerous meetings the coke-workers in the Connellsville region have prepared a joint scale of wages, similar in many respects to the scale now in effect between the H. C. Frick Coke Company and their employees. Like the Frick

Table I.—Unarmored Vessels.

Name.	Condition.	Guns.	Tonnage	Horse-Power or speed.
Dolphin.....	In commission..	1 6-inch rifle.....	1,485	2,240
Boston.....	In commission..	2 8-inch rifle, 6 6-inch rifle..	3,189	3,780
Atlanta.....	In commission..	2 8-inch rifle, 6 6-inch rifle..	3,189	3,350
Chicago.....	In commission..	4 8-inch rifle, 8 6-inch rifle, 2 5-inch rifle.....	4,500	5,064
Charleston.....	Launched.....	2 8-inch rifle, 6 6-inch rifle..	3,780	7,000
Baltimore.....	Launched.....	4 8-inch B. L. R., 6 6-inch B. L. R.....	4,413	9,000
Yorktown.....	Launched.....	6 6-inch B. L. R.....	1,700	3,000
Petrel.....	Launched.....	4 6-inch B. L. R.....	890	1,100
Newark.....	Building.....	12 6-inch B. L. R.....	4,063	8,500
Philadelphia.....	Building.....	12 6-inch B. L. R.....	4,324	19 knots
San Francisco.....	Building.....	12 6-inch B. L. R.....	4,083	19 knots
Concord.....	Building.....	6 6-inch B. L. R.....	1,700	3,400
Bennington.....	Building.....	6 6-inch B. L. R.....	1,700	3,400
Vesuvius.....	Launched.....	3 15-inch dynamite guns.....	725	20 knots
First-class torpedo boat.....	Building.....	8 automobile torpedoes.....	99	23 knots
Cruiser No. 6.....	Building.....	.....	5,800	20 knots
Cruisers No. 7 and No. 8.....	.....	.....	3,000	19 knots
Cruisers No. 9 and No. 10.....	.....	.....	2,000	Speed not fixed
Practice vessel.....	.....	.....	800	.....

her 12,000 horse power, that she will develop a speed of 21½ knots.

Of the new vessels for the American navy which have been under trial none have developed such remarkable speed as the dynamite cruiser Vesuvius, now undergoing a series of trials before a board of United States naval officers. The Vesuvius has developed a rate of speed equivalent to

scale, the new scale is based on coke at \$1.35 per ton. When coke is selling at that price the wages to be paid are as follows: Mining room coal, per 100 bushels, 89 cents; mining heading coal, \$1.04; mining wet heading coal, \$1.12; coke drawing, per 100 bushels charged, 54 cents; cagers, 10-hour run, \$1.99; drivers in shafts and slopes, \$1.99; drivers in

Table II.—Armored Vessels.

Name.	Condition.	Guns.	Horse power.	Tonnage.
Maine.....	Building.....	4 10-inch B. L. R., 6 6-inch B. L. R..	9,000	6,648
Texas.....	Building.....	2 12-inch B. L. R., 6 6-inch B. L. R..	8,000	6,300
Coast Defense.....	Plans ready.....	1 16-inch 115-ton B. L. R., 1 12-inch 48-ton B. L. R., 1 15-inch dynamite gun.....	5,400	4,000
Puritan.....	Completed in hull....	4 10-inch B. L. R.....	3,058	6,060
Terror.....	Completed in hull....	4 10-inch B. L. R.....	888	3,815
Miantonomoh.....	Completed in hull....	4 10-inch B. L. R.....	1,030	3,815
Amphitrite.....	Completed in hull....	4 10-inch B. L. R.....	1,000	3,815
Monadnock.....	Completed in hull....	4 10-inch B. L. R.....	3,000	3,815
Armored cruiser.....	Not commenced.....	.....	.....	7,500

21.47 knots per hour, and what with the terrible destructive powers possessed by her three 16-inch dynamite guns she will be one of the most formidable vessels in the navy.

The advance in the type of guns has been one of the most marked features of our naval development. The guns now in course of construction for the new vessels are the designs of an ordnance board composed of navy officers. These guns have attained remarkable success, and the velocity obtained compares favorably with the best results of those of Armstrong's and Krupp's build. The principal developments during the year in the department of ordnance have been in improved powder and projectiles. The greatest improvement in the manufacture of gunpowder has been made in France and Germany, whereby, in case of the former, initial velocities of 2400 and 2600 foot-seconds have been obtained. Such an increase in velocity increases the energy of the projectile. In the case of the new 6-inch breech-loading rifles a projectile

drift mines, \$1.89; roadmen, horsebackmen, and timbermen in drift mines, \$1.89; in shafts and slopes, \$1.99; inside laborers, \$1.53; trappers, per day, 71½ cents; rope-riders, per turn, \$1.89; leveling, per oven, 9½ cents; yard laborers, \$1.36; car-forkers, 20-ton cars, 92 cents; 40-ton cars, \$1.12; dumpers and tippelmen, \$1.53; firemen, \$1.73.

Under the Frick scale, at the same basis, wages are as follows: Mining room coal, 90 cents; heading coal, \$1.05; wet heading coal, \$1.12½; cagers, \$1.95; drivers, shafts and slopes, \$1.95; in drifts, \$1.85; roadmen, horsebackmen and timbermen in shafts and slopes, \$1.95; in drifts, \$1.85; inside laborers, \$1.50; trappers, 70 cents; rope-riders, \$1.85; dumpers and tippelmen, \$1.50; firemen, \$1.70; coke drawers, 53 cents; leveling, 9½ cents; yard laborers, \$1.35; car-forkers, 40-ton cars, \$1.10; 20-ton cars, 90 cents.

A comparison of the two scales shows that the minimum wages under the joint scale are slightly in advance of those under the Frick scale for all classes of labor

except miners, roadmen, horsebackmen and timbermen. As compared with the scale recently adopted by the Amalgamated Association, there is an advance over all classes of work except mining room coal, mining in wet headings, trappers, forgers and yard laborers. Under the last-named scale the minimum wages are as follows: Mining room coal, 95 cents; heading coal, \$1.12; wet heading, \$1.20; cagers, \$1.95; drivers in shafts and slopes, \$1.95; in drift mines, \$1.85; inside laborers, \$1.50; trappers, 80 cents; rope-riders, \$1.85; dumpers and tippemen, \$1.65; roadmen, timbermen and horsebackmen, \$1.95; firemen, \$1.70; coke drawers, 54 cents; levelers, 94 cents; yard laborers, \$1.40; car-forkers, 95 cents and \$1.15.

For every advance of 10 cents in the selling price of coke, wages under the new scale will advance 4 cents for miners, cagers, drivers, roadmen, horsebackmen, timbermen and rope-riders. For inside and yard laborers, dumpers and tippemen the advance is 3 cents. The advance for coke-drawers and trappers is 1½ cents, car-forkers, 2 cents, and firemen 3½ cents. Under the Frick scale the advance is 2½ cents per 100 bushels on mining, 1½ cents on drawing, and 2 per cent. on all other labor for every advance of 10 cents in the selling price of coke. The Amalgamated

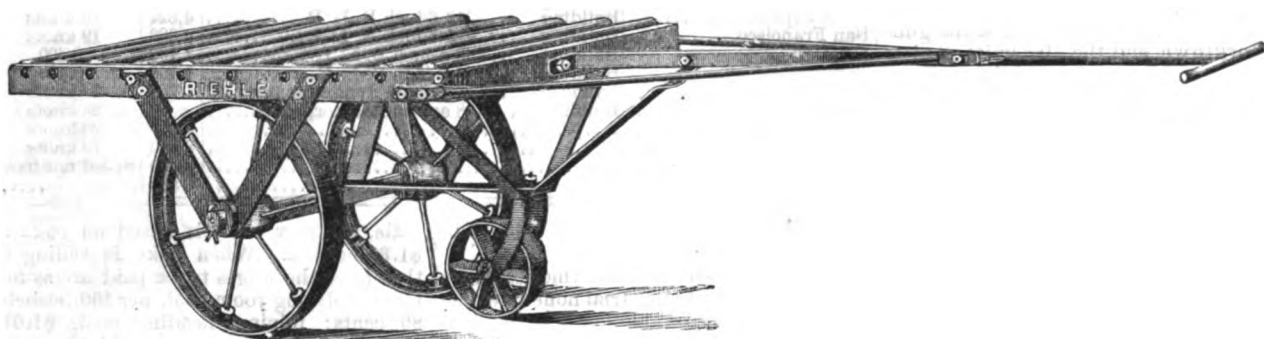
Waterous Engine Works, of Brantford, Ontario, the largest exporters of engines of the dominion. The South Park Bridge and Bolt Works is also an important manufactory, making specialties of railroad work and architectural iron forgings. Its president, Joseph W. Morgan, was of the Hall & Morgan Iron Works, of Wilmington, Del. He built Memorial Hall, at the Centennial Exhibition, and numerous bridges over the Schuylkill and other rivers were constructed under his personal supervision. He invented the Morgan nut lock and bolts for railroad work.

Slab Truck for Rolling Mills.

Messrs. Riehle Bros., proprietors of the Philadelphia Scale and Testing Machine Works, 413 Market street, Philadelphia, Pa., are adding to their already extensive assortment of products articles suitable for rolling mills, steel works and blast furnaces. The annexed illustration represents the Riehle slab truck. This truck was designed and constructed by them for the Carbon Iron Company, Pittsburgh, Pa., and it is offered with confidence to rolling mill managers and superintendents. It is built in a substantial manner and is well adapted for the rough use to which it

are to attempt anything like a general introduction of manual training in the schools in the near future, we must first teach the teachers. To do this our normal schools must be prepared in equipment and instructing force for the demands which will be made upon them. Some of them are already anticipating this demand, and are putting into operation, in a moderate, tentative way, a system of industrial training for their scholars who are to be the future teachers of our schools. The ability to do this should be placed in the hands of all our normal schools as fast as they are ready to carry the system into practical effect. It is a great mistake to suppose that this will require large buildings and expensive outfits. All that is desirable in this direction cannot be accomplished in a single year, and it is therefore recommended that reasonable appropriations for this specific purpose be made to each and all of our normal schools if it should be deemed wise to begin such training at once."

Under the new agreement adopted by the general managers of the Western Freight Association roads December 20, 1888, and which the presidents, at their meeting in New York a day or two later, pledged



SLAB TRUCK FOR ROLLING MILLS, MADE BY RIEHLE BROS., PHILADELPHIA, PA.

scale provides for an advance of 5 per cent. in the wages of miners and drawers, and 4 per cent. for all other employees for each advance of 10 per cent. in the market price of furnace coke.

The new joint scale has been placed in the hands of a scale committee, which has been granted discretionary powers in the matter of regulating the restrictions under which the scale can be signed, but will not be allowed to sign it unless it is found that it will be agreed to by a majority of the operators. The Scale Committee mentioned above have made several requests of the operators that a day be appointed for a conference in order to discuss the new scale. So far the operators have refused to grant these requests, and as yet no conference has been held. The new scale is not looked on with favor by the operators, and several have stated that they will not grant any advance in wages until there has been a further advance in the price of coke. From present appearances this will not take place for some time yet.

Manufacturing in St. Paul.—There has been a large investment in manufactories of various kinds in St. Paul during the year. At South Park the railroad shops of the Chicago, St. Paul & Kansas City line are located. They occupy an area of 8 or 10 acres and have cost over a quarter of a million dollars. Fully \$50,000 of that outlay was made in 1888. Also at South Park are the Holland & Thompson brass works and the Waterous Steam Fire Engine Works. The latter is a very substantial concern and a branch of the

will be subjected. The wheels are furnished with friction rollers to give easy motion and light running service, and a swivel-caster forms the guide or fifth wheel. The dimensions of the truck are: Extreme length, 11 feet; width, 34 inches; height, 27½ inches; weight, 600 pounds. Size of platform, 5 feet x 2 feet 6 inches; gauge of wheels, 22 inches; diameter of wheels, 24 inches; tread of wheels, 3 inches; size of axles, 1½ inches; length of hub, 4 inches. Messrs. Riehle Bros. also make a tire truck, originally designed and constructed for the Standard Steel Works, Lewiston, Pa. They also manufacture pig-iron trucks and turn-tables for blast furnaces.

Manual Training in Pennsylvania.—Industrial manual training is a subject treated at some length by Governor Beaver, of Pennsylvania, in his message just delivered. He says: "It may be doubted whether or not the Legislature has power, under the Constitution, to provide for the training of tradesmen in any particular calling. There can, however, be no special or class legislation in that kind of training which educates the eye and the hand of every boy and girl in the commonwealth, so that they can be applied to the practical demands of life when their school days are over. The education of the hand, so that it can be applied dexterously to the practical work which comes to every man in solving the problem of life, is just as important as the knowledge of arithmetic which is applied in so many different ways by those who become acquainted with its rudiments in our public schools. If we

themselves to have firmly maintained for sixty days, all lines were given liberty to meet the contract rates on steel rails until the chairman of the association was notified that the contracts had expired, no line, however, being authorized to make the rate on rails less than \$3 per ton, Chicago to the Missouri river, after January 31, 1889, when the full tariff should go into effect. The restored rates took effect January 1, except where they were affected by existing contracts.

The iron manufacturers of Mahoning and Shenango valleys held a conference with the freight agents of the various iron carrying lines in Pittsburgh on Saturday. They entered a protest against the new freight rates which went into effect January 1. They claimed and attempted to prove that the new rates would almost, if not entirely, shut them out of the Chicago and other Western markets. The new rates are on a basis of 25 cents per 100 between New York and Chicago, East and West. The old rate was 5 cents less. Pittsburgh manufacturers were called upon to make a statement in support of the stand taken by their brethren of the valleys, but they were not inclined to give many valuable points. The railroad men took the matter under consideration, but did not hold out any encouragement that the change demanded would be made.

Colored covers are gaining converts among the technical press, the last to follow the prevailing fashion being the *Engineering and Mining Journal* and the *Age of Steel*.

THE METALS IN 1888.

Tin.

The extremes of value in both directions were even greater last year than they had been in 1887, which had inaugurated the great speculative advance. While the French syndicate had two strings to its bow, Copper and Tin, and thought fit to maintain the latter at the high figure to which it had been raised, a sullen and monotonous state of affairs prevailed. The onslaughts by the bear operators, however persistent and justified by the general position of the metal, did not succeed in bringing down the price. In this manner the first four months of the year were featureless, consumers limiting their operations to the filling of immediate requirements, while producers made the greatest efforts to market their output as fast as possible while the high range lasted.

The year opened in London at £167, closing the month of January at £170, while our own market, opening at 37½¢, wound up at 36.90¢. In February London receded from £170 to £166, and New York from 36.80¢ to 36.25¢. In March and April London kept steady at £166 till the close of the latter, when a sudden break occurred to £111, New York following suit, and dropping from 36.80¢ to 24¢. A further rapid decline took place in May to £79. 12/6 on the 10th of that month, followed by a recovery to £87, closing the month at £85. 15/; in this city meanwhile the metal gave way to 21¢, staying there during a fortnight, and then suddenly going off to 19½¢, which closed the month.

The fact is that toward the close of April the statistical position of the metal had become precarious enough, the visible supply in Europe and America being 23,995 tons on May 1, against 11,832 on May 1, 1887. During the 12 months ending April 30 the Straits had shipped to London 23,479 tons, as compared with 12,685 the previous 12 months; to this country 8115, against 5880; Australia to London, 6900, against 6019, and to the United States, 825, against 1250, the total being 33,319, against 25,784. Simultaneously the deliveries in London, Holland and the United States were 30,108 tons, against 34,119. During the three preceding years they had been respectively 33,046, 34,739 and 35,968. While the shipments had increased 28%, the deliveries showed a falling off of 12%. With a visible supply of 11,832 tons, the price of tin was £102. 15/ on May 1, 1887; it was £94. 10/ on May 1, 1888, with a visible supply of 12,186 tons. When the French syndicate perceived that at the high price of £166 in London, and 36½¢ here, consumption fell off at a fearful rate, and that it would be better policy to get out of Tin and concentrate its attention more exclusively on Copper, it first made some considerable sales in London at £180 for near forward delivery, and then declared its resolution of not putting in a bid at the Batavia Billiton sale of April 25. This gave the signal for a break, but the syndicate covered the sales made at £180—alluded to above—at £105, and still made a handsome thing of this transaction. Subsequently, it is true, the market, as we have shown, went as low as £79. 12/6, which was altogether too great a drop, as the speedy rebound proved. Of the actual stock of the syndicate, nevertheless, comparatively little seems to have been sold during the interval, it being estimated at the time that its holdings in England and Holland still aggregated some 16,000 tons on June 1. The syndicate evidently waited for a higher ruling and greater steadiness later on, in order to realize gradually, and this purpose appears to have been carried out.

While this great change occurred in April and May, the invisible supply—i. e., the holdings in the hands of dealers and consumers—had run very low. Even at the lower range, between £79. 12/6 and £87, comparatively little had changed hands to go into actual consumption, because of the general demoralization still pervading the trade. Speculation was ready, however, to turn over a fresh leaf now that a basis of values had been reached affording good opportunities for handling the metal in a moderate bull campaign. This appeared all the more plausible as it became pretty certain dealers and consumers would thenceforward take courage once more and replenish the exhausted supplies.

Thenceforward, during the latter half of the year, under this legitimate demand, moderate though it after all may have been for other reasons, Tin values worked themselves gradually up again to £100 and over, and a steadier trade resulted, in spite of the fact that the statistics improved on the whole very slowly.

Midsummer dullness in trade and a lingering hesitation on the part of consumers to take hold still caused irregularity and weakness the latter part of June. Opening at £85. 15/, the closing quotation was £75. 2/6, while in New York the price fell from 19.20¢ to 17¢. In July this feeling made room for a more hopeful one, the price advancing from £76. 5/ to £89. 7/6, and from 17.50¢ to 20.10¢. The upward tendency made some further headway during August, there being an improvement from £88. 15/ to £97. 12/6, and from 19.60¢ to 22¢. September developed the greater buoyancy still further, an advance taking place from £96 to £108. 17/6, and here from 21.95¢ to 23.70¢.

The advance over £103, as is usually the case, became too tempting for operators for a fall, and the speculative interest taken in the metal gradually increased in volume, leading to continual, but at no time violent, fluctuations. Thus in October the opening figure was \$103. 10/, and the one at the close \$102; here the price gave way from 23.20¢ to 23¢. November witnessed a decline from £102. 2/6 to £101. 5/, and from 22.90¢ to 22.15¢. Opening at £100. 10/ December 1, London finished the year at £100. 2/6, while New York gave way from 22½¢ to 22¢ at the close.

Lead.

Last year has been one of the dullest on record, so far as actual consumption of Lead is concerned, while, from a speculative point of view, it has been the most active and excited in the New York market. There has been disappointment both about the spring and fall trade. The spring was late and consumption fell off about one-third. The building trade was not as active as had been expected, there being a partial reaction both in real estate and the extent of building in and near great cities. It was hoped the fall would still make amends, but these hopes were not realized, business in Lead for consumptive purposes remaining dragging in the extreme to the close of the year. The White Lead industry did not work evenly and satisfactorily, and the attempt to mend its irregularities through a combination proved in its essential purposes a failure. While the elements of absorption were thus hampered and curtailed, production was known to be on the increase. Everything thus conspired to render speculation for a rise difficult and precarious as to the ultimate results. If the metal had been left to shape its own course under the circumstances, it is probable that most of the time the price in New York would have been nearer 34¢ than 44¢, yet the chief operators from the very outset of the year had marked the same out for a big bull campaign and persevered in it in spite of the well-

meant warnings of the trade papers in the branch. The result of this large speculation for a rise in Lead, in which the West largely participated, blinded by deceptive local considerations, could hardly be different from what it has been. The wonder is that the collapse did not come sooner. Operations even extended to London, in order to thus make an impression on our market and less for the purpose of drawing Lead from there, for which there was hardly any necessity, there being plenty on this side. Although it had not been an easy matter to start speculation in Lead futures on our Metal Exchange properly, the thing fully succeeded this time, and during a month or two any amount of dealings occurred there, the more so as the regular consumers on the spot and in neighboring cities could not be coaxed into anticipating requirements at the artificially enhanced ruling, their trade being too dull, and the prices not in keeping with the real position of the metal, either in our midst or out West. While this was the case on this side repeated attempts were made to create a Lead syndicate of producers in Europe, but they all failed, as it was found impossible to get the Spanish producers to bind themselves by a compact of the kind, their interests and those of others on the Continent and in England being too wide apart. This alleged scheme of a strong syndicate over there only added from time to time fresh fuel to the agitation kept up here by the main manipulators, and confirmed the latter in their dangerous game. In London the year opened at £15. 15/ with Soft Spanish and closed at £12. 17/6.

Domestic Lead Prices in New York, 1888.

Cents.		Cents.	
Jan....5.00	@ 4.85	July...3.97½	@ 4.15
Feb...4.90	@ 5.17½	Aug...4.17½	@ 4.93½
March...5.20	@ 5.10	Sept...4.95	@ 5.15
April...5.02½	@ 4.70	Oct...5.17½	@ 3.70
May...4.65	@ 4.07½	Nov...3.80	@ 3.70
June...4.02½	@ 3.95	Dec....3.65	@ 3.85

Spelter.

Spelter has at times during the year developed considerable buoyancy and strength on both sides of the Atlantic, proving as a general thing that consumption is able to cope fully with production. This was shown in Europe during the early part of the year in particular; it became manifest on this side in the fall. In Europe the International Syndicate has thus been able to engineer a gradual advance, from which it later on receded, when it was found that consumption was

Domestic Spelter Prices in New York (ordinary Brands), 1888.

Cents.		Cents.	
January...5.75@5.25		July...4.50	@4.55
February...5.25@5.30		August...4.90	@5.00
March...5.30@5.12½		Sept...5.10	@5.15
April...5.00@4.70		October...5.12½	@5.25
May...4.65@4.70		Nov...5.12½	@5.87½
June...4.60@4.45		Dec....5.50	@5.00

receiving a check. Our own Domestic Spelter has at no time been very active; still it has moved off into consumption steadily, and at one time, in the fall, became so scarce out West that it advanced several dollars per ton, and the metal followed suit slowly till later on the dull season set in, and prices settled down to the former level.

It has been demonstrated that in piping natural gas in pipes of one size considerable of the pressure is lost, about eight pounds per mile; but by using the telescope system, smaller pipe at the well and gradually increasing the size toward the point of consumption, that the loss of pressure is reduced to about three pounds per mile.

The notorious steamship Haytian Republic is owned principally by Augustus Hemenway, a wealthy citizen of Boston.

The English Merchandise Marks Act.

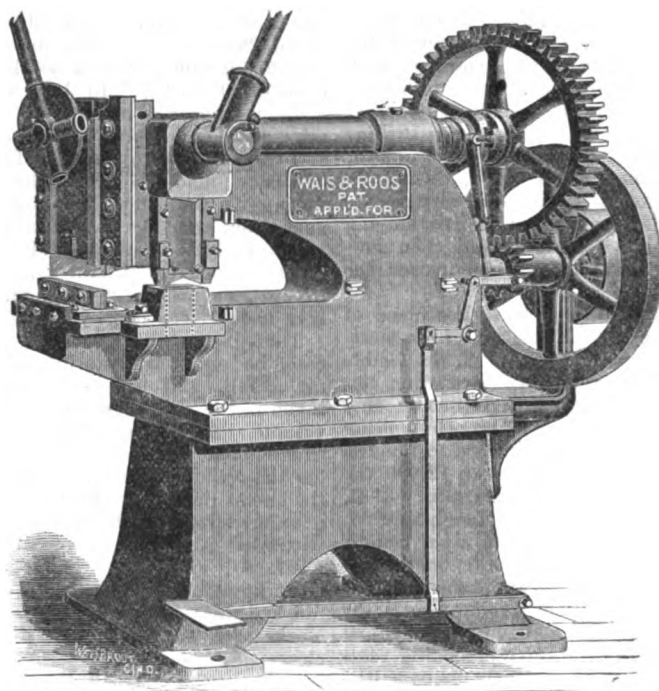
The Merchandise Marks act came into operation on the 1st of January last, and a good many complaints have been made as to the manner in which it is administered. Hence the account of its working in the Report of the Commissioners of Customs just issued is of unusual interest. The report covers only three months of this year, but in that period 2152 consignments were detained for the directions of the commissioners in London and Liverpool, and 1739 at the other ports, besides those which came by the parcels post. These consignments included 110,000 cases and packages, and the goods contained in them were of almost every conceivable description. The act was passed chiefly for the purpose of preventing not merely the forging of trade marks, but the importations of foreign made goods which are so marked as falsely to indicate that they are English. It is obvious, says the *London Daily News*, that goods which have English words on them thereby convey a suggestion of English or American manufacture. A Swiss does not put "Fast" or "Slow" on the regulator of his watch, nor does a German print "Tobacco" on his pouches, nor "Gold," "Silver," "Stamps," on the divisions of his purse. Still, as these are not "trade descriptions" in the language of the act, the commissioners have not excluded such articles. The rule laid down—a rule which seems to be perfectly fair and workable—is that goods made abroad must not only not bear marks or words which suggest that they are of British manufacture, but, if they have English names on them, must also show the country in which they are made. Thus, if German goods bear such a name as "John Brown," it is required that the words "made in Germany" shall be added. The commissioners refused to accept the words "made abroad" as sufficient; nor was the addition of the word "Germany" alone regarded as enough to qualify such a legend as "John Brown," "London and Berlin." They have in such cases justly required a statement which shall leave no doubt about the actual country in which the goods are made.

Worked in this sense the operation of the act is simply to prevent fraud. It is clear that German goods stamped with English names are meant to be sold as English. It is more difficult to deal with American goods, since there are manufacturing towns in the United States of the same names as our own. In these cases the almost arbitrary signs by which the Americans indicate the names of their States give no sufficient warning of American origin. Few Englishmen know that "Pa." means Pennsylvania, or "Me." Maine, or "O." Ohio. The commissioners therefore suggest that after such abbreviations the letters "U. S. A." should be used. Swiss watches sometimes have the words "Sterling silver" on the case. This is a clear suggestion of English origin, and it is now required that a distinct statement of Swiss manufacture should accompany these words. A question which arose about Swedish iron was settled by the intimation that in no case would it be admitted if it bore the name "Lancashire" alone, but "Lancash-Swedish" was accepted as sufficient. English inscriptions on the packages containing goods—such, for example, as "Hose, White Cotton, size 10," are also to pass. The act, therefore, cannot be said to be worked oppressively. Among the seizures, chiefly at Southampton, have been eggs, fruit and butter, with English descriptions. In the majority of cases these articles have been admitted on the illegal marks being destroyed, or sufficiently qualified. On the other hand, there is one kind of fraud which the act does

not meet. The commissioners, for instance, have admitted glass buttons which were described as "jet." Probably, if the buttons had been called "Whitby jet" they would have seized them. It is an obvious defect in the law that the custom house should be obliged to wink at such deceptions. The commissioners and their staff of officers deserve, however, the thanks of the whole manufacturing community for the zeal and discretion with which they have administered the Merchandise Marks act.

Combined Punch and Shear.

The firm of Wais & Roos, of No. 7 East Seventhstreet, Cincinnati, Ohio, are bringing out a new punch and shear designed more especially for the use of stove and range manufacturers. The reader will be enabled to form a very clear idea of its general appearance from a careful examination of the cut shown herewith. This machine is provided with a punch measur-



COMBINED PUNCH AND SHEAR. WAIS & ROOS, CINCINNATI, OHIO.

ing 3 feet in length by $\frac{1}{4}$ inch in width, while the blades of the shearing attachment measure 9 inches. In operating the machine the clearance hole is first punched, after which the sheet is brought under the shear. The throat of the shear has a depth of 24 inches in the clear, so that a 48-inch sheet may be readily cut from center to the outside. In cutting range fronts all drawing of sheets is avoided, and the blanks of door holes may be employed for the doors, a feature, the makers claim, which will be found of great value. It is also claimed that the machine is very economical of labor and performs its work with much greater accuracy than can be secured by the use of hammer and chisel. The machine can be run with either hand or steam power, and may also be used as an ordinary punching machine by the substitution of an ordinary punch for the shear rest. The statement is made that the machine will cut a sheet $\frac{1}{4}$ inch thick and a plate or bar $\frac{1}{2}$ inch thick. It is made in two sizes, No. 1 being for steam or hand power, while No. 2 is for hand-power only.

The Samoans have lost five high chiefs and about 60 men in battle, the German Consul sympathizing with the rebels, whose

king was sent off in captivity on board a German steamer. A correspondent at the Islands says "the trouble seems to have been originally fomented by a Hamburg trading company, in whose behalf the German Consul has acted in a high-handed way, and, if reports are true, in violation of the agreement of neutrality between the United States, England and Germany."

NEW PUBLICATIONS.

METALLIC ALLOYS. Translated from the German of A. Krupp and Andreas Wildberger, by Wm. T. Brannt. Size 5 x 8 inches; 428 pages. Published by Henry Carey Baird & Co. Price \$2.50.

It becomes apparent from the above that the work has been translated from the German, but we find it stated that extensive additions have been made by the translator and editor. In any event, however, it will be welcomed by a large class of readers, since there is no other recent book in the English language on metallic

alloys which combines with practical usefulness a sufficiently popular character for those who have not made metallurgy and its kindred arts objects of special study.

The book opens with an interesting account of the physical and chemical relations and special properties of metals, and then takes up the properties and preparation of alloys in general; first among them the copper alloys. Under this head a good deal of space is given up to brass, its manufacture, and method of casting red brass, white metal, imitation gold alloys, bronzes, gun and bell metal and speculum metal. Under nickel alloys we find some interesting matter on German silver, a special chapter being devoted to its manufacture on a large scale. Various other alloys, such as those of aluminium and copper, Britannia metal, tin, lead, cadmium and bismuth alloys are then considered, and also those of silver and gold and platinum. Alloys of mercury and other metals, or amalgams, form an interesting chapter by themselves. The concluding portion of the book refers to various kinds of solder. The special additions which have been made to the book are embodied in an appendix, which is devoted to the coloring of alloys.

THE WEEK.

The storage capacity, the daily consumption and the day's supply of water in several leading cities is computed by the *Engineering News* as follows:

	Storage.	Daily use.	Day's supply.
Philadelphia . .	373	88.50	4.2
New York.....	18,325	110.00	166.6
Brooklyn.....	1,180	46.27	25.5
Baltimore.....	933	34.00	29.2
Pittsburgh.....	120	30.00	4.0
Rochester.....	65	7.20	9.1
Albany.....	216	9.00	24.0
Jersey City.....	237	16.50	14.4

Secretary Whitney invites proposals for the construction of the \$550,000 dry dock at the League Island Navy Yard.

The bridge between Covington and Cincinnati has been turned over by the Contractors to the Chesapeake and Ohio Railroad Company, who expect to run trains through to Newport News this week.

A tow of loaded barges passed Newburgh on the 3d inst., an extraordinary event for this season of the year.

Abnormal prices in the United States, the effect of speculation, have checked shipments of wheat from the United States, until now, according to London estimates, the supplies received in the United Kingdom from this source during 1888 were reduced about one-half compared with the previous year. Eastern Europe has made good the American deficiency, and especially Russia. There was an increase of 15,000,000 cwt. from Russia, which sent four times as much as in the corresponding 11 months of 1887. The British wheat supply has thus been shifted in a large measure, Russia profiting at the expense of the United States. The British consumer is complainant in the reflection that, regardless of harvests in one part of the world or another, and of consequent market fluctuations, the price of the loaf has remained the same within a fraction that it was when the United States exported most abundantly. "On his part," we are told, "he has provided himself with the best equipment for annihilating space and distance. Whether the corn fields which for the time have caught his preference be in India, Bessarabia, Tennessee, Winnipeg or Chili, makes little or no difference to him. He is prepared with means of transport which minimize the topographical dissimilarities." Steamships have brought together the ends of the earth and made the whole world kin.

The Nicaragua Canal bill passed the House by a vote of 157 to 34, after being materially amended as it came from the Senate. In its present shape it is claimed the United States assumes no pecuniary responsibility for the acts of the company.

Prominent dry goods houses in this city protest against the Battery site being selected for the appraiser's stores, rather than rebuild the structure now in use, but the Chamber of Commerce hesitates in its recommendations.

Railroads opening the Northwest have been among the most important of the extensions made during the past year. Especially to be mentioned is the new line opened up by the St. Paul, Minneapolis and Manitoba Railroad to the Pacific Coast, the new line to Winnipeg and the Northwest territory established by the Northern Pacific and the new route to the East by way of the St. Paul, Minneapolis and Sault Ste. Marie Railroad. It is the intention of the latter to establish through train service between St. Paul, Boston and Canadian cities during the coming season.

Ocean penny postage is pronounced feasible. A member of the British Parliament says that last year 12,000,000 of letters and 2,500,000 pounds weight of newspapers,

&c., were sent to America, for which the steamship companies received less than \$500,000, while the English Post Office received more than \$900,000 for stamps.

The inadequacy of wharfage facilities on the East River front and special privileges given to certain corporations, to the exclusion of shipping which from a remote period has shared in their use, has prompted business men to organize the East River Water Front Protective Association, to prevent encroachments and the granting of monopolies. From West Twenty-third street, North River, to the foot of Grand street, East River, there are 130 piers, and about 100 of these are already shedded. Twenty of the remainder have been set apart for special commercial purposes—canal boats, &c.—leaving about ten piers for the use of the public. Philadelphia, Baltimore and Boston are, it is urged, offering special inducements for the commerce of New York, and it is argued that the shortsighted policy of the Dock Department, of leasing the wharfage facilities of this city almost exclusively to corporations, cannot but militate against the interests of New York City.

The State Capitol building of Missouri, remodeled at a cost of \$213,000, has a dome 138 feet above the roof, which is semi-mansard, slated, with cornice and ornaments of galvanized iron, also stairways of iron.

Governor Hill recommends the compulsory investigation of fires, for the prevention of incendiarism. It is believed that it is possible to reduce the fire loss at least one-half, or \$50,000,000 a year, in the United States, and in like proportion \$7,500,000 in the State of New York.

The report of Colonel O. M. Poe on the commerce of the St. Mary's Falls Canal during the season of 1888 shows that there was a decrease of 1552 in the number of vessels of all kinds which passed through the canal, but there was an increase of 233,061 tons in the registered tonnage, indicating an increase of 37 per cent. in the average size of the vessels used, a condition said by the report to be decidedly favorable to the canal. The amount of freight transported during the year was 916,776 tons greater than last year, and gratification is expressed at this increase, as it was expected no material increase would be shown because of the completion of three new lines of railroad which compete with the canal. The value of the commerce shows an increase of only a little more than \$3,000,000, and the report ascribes this to the decrease in shipments of grain, manufactured iron and copper.

Lord Salisbury, in the British Parliament, refers to the enormous offensive powers of foreign countries and the necessity for a defense of the mercantile ports.

The New York Legislature will be asked for \$1,000,000 for the improvement of the canals. Larger locks are demanded.

The superb fire-proof building just finished on Park avenue for the German Friendship Club cost over \$500,000. Among the various improvements is ventilating machinery, by which 60,000 cubic feet of either cold, mixed or hot air can be distributed through the building in a single minute or concentrated at will in one room.

Judge Lawrence, of the Supreme Court, decides that the electric wires in this city must come down, despite the protests of those who represent that underground wires are not feasible. He sees "no reason for interposing the strong arm of the court to arrest the progress of a great public work, the speedy completion of which is desirable for the safety and convenience of the people." The struggle over the wires

is further complicated by a suit brought by the United States Illuminating Company against the subway commissioners for \$250,000 damages for alleged unwarrantable interference with their business and unjust discrimination.

A company just formed in Brussels announce their intention to build a railroad 250 miles long to connect the head of navigation on the lower Congo with Stanley Pool and the 6000 miles of navigable waterways above it. The expectation is to stimulate traffic between the Upper Congo and the markets of Europe.

St. Paul claims to have expended \$30,000,000 in building operations during the past year, and to have a population of 200,000. There are 1101 manufacturing establishments in the city, which last year turned out products valued in the aggregate at \$44,388,330, an increase of \$5,622,020 over the previous year.

The old "Q." engineers found that they were boycotted, their former employers having turned on their tormenters, making it extremely difficult for them to ply their vocation. It is understood that the difficulty, which has cost the company millions of dollars, has at last been compromised by an agreement, not only recognizing the engineers as members of the craft, but giving them a preference as vacancies may occur in the positions they formerly held.

On the 30th day of September, 1888, the total funded debt of the State of New York was \$6,965,354.87, classified as follows:

Indian annuities (general fund)....	\$122,694.87
Canal debt.....	6,142,660.00
Niagara reservation bonds.....	700,000.00

Total.....\$6,965,355.87
Aggregate sinking fund.....4,076,298.39

Total debt unprovided for, but not yet due.....\$2,889,065.48

The tax rate for the current fiscal year is 2.62 mills, which, on the present assessed valuation, will yield \$9,089,303.86.

Warden Durston, of the Auburn State prison, has filed with the superintendent of State prisons his balance sheet complete to January 1, showing that under the State account system of prison labor the Auburn prison has deposited in the State treasury \$69,378.29 more than it has received from the treasury for carrying on the various industries.

A large machine for packing the snow in the streets and flattening out snow-drifts has been tested and proved a success at Negaunee, Mich. It consists of two rollers on a heavy shaft. The rollers are a little over 6 feet in diameter, and are about that in length, the width of the machine being 10 or 12 feet. The rollers consist of heavy iron castings covered with hardwood lagging. Scrapers behind keep the snow from sticking to the rollers.

The steel and iron steamship *Montana*, built in England one year ago, was sunk by a collision, near Baltimore, on Saturday, during a fog. The disaster is similar to that which recently befell the West Indies steamer *Atlas*, in New York harbor. The *Montana* cost over \$300,000, and had six bulkheads.

The Minister of Guatemala to the United States speaks of the monopoly held by the Panama Railroad as among the chief obstacles to traffic between the United States, Central and South America. Short credits, high freights and careless packing of merchandise are also serious impediments.

E. L. Corthell, the engineer, who assisted Captain Eads in some of his engineering enterprises, is now in New Orleans inquiring into the feasibility of the bridge

proposed to be built over the Mississippi, immediately above the city, so as to allow all the railroads from Texas to come directly into New Orleans without ferrying.

The so-called electric sugar-refining process has suddenly come to grief, the alleged new discovery being pronounced fraudulent, and shares that recently sold for \$415 are now offered at nominal prices. English investors are said to hold 3000 out of the 10,000 shares of stock issued. The company established an expensive refinery at the India docks in Brooklyn. They were to put in such machinery as ordered by Henry C. Friend, the inventor, now deceased, and when he had convinced them by demonstration that his process would do what he claimed for it, the secret was to be revealed to them and to become theirs in consideration of a large sum of money, variously estimated at \$100,000 to \$500,000, the money meanwhile to be on deposit with a trust institution in this city. It is now charged that the buildings contained little of value, that Friend and his successors had refined sugar brought into the refinery in large boxes, under the guise of machinery, and so treated as to alter its appearance and character somewhat, deceiving those who were invited to make the examination. The president and secretary, urged by indignant stockholders, broke into the secret apartment of the refinery, but, aside from machinery for crushing raw sugar, found no electrical apparatus or other novel contrivance.

A "flour trust," the Northwestern millers declare, has not been formed, but it is admitted that at least 250 mills ceased operations January 1, in conformity to resolutions adopted at a convention recently held in Milwaukee to the effect that the output of flour should be curtailed one-half. Mills scattered through the wheat belt representing a daily output of 75,000 barrels of flour are running at half their capacity or are closed entirely. The trouble is largely due to the artificial advance of last September, which forced cash winter wheat at St. Louis to \$1.15 and spring wheat at Chicago to something like \$2 in one day, cutting off shipments to Europe and reducing the domestic consumption. The shut-down will continue, it is said, until the flouring business is re-established on a paying basis. The decline in wheat since the Milwaukee meeting is about 8 cents per bushel, but is still too high for export, either as wheat or flour.

The Minnesota State Board of Prison Inspectors, after a careful examination of the principal prisons and reformatories of the United States, has made a report favoring a return to the contract system that was abolished by the Legislature of 1887. They recommend that the entire management of the institutions be as far removed as possible from the uncertainty of politics. "Labor is indispensable to the convict and to the reformatory," says the report. "It must be productive, creating something which must necessarily go into the world's market on the same footing as any other product of labor."

Advices from Seoul to December 6 represent that China has made a demand that the Korean king be deposed, and that Korea shall acknowledge to all the powers that she is a dependency of China. The Korean diplomats at Washington are much agitated by the news. Russia is supposed to have a hand in the business.

The obscure hamlet of Campbell Hall at once becomes an important railroad center as a consequence of building the Poughkeepsie bridge. It is in Orange County, nearly 30 miles back from the Hudson River, and has been designated as the terminus of the Poughkeepsie Bridge

connecting railroad in that direction in a straight line between the bridge and the coal and iron fields of Pennsylvania.

Massachusetts savings banks contain \$315,185,070, an increase of over \$12,000,000 during the past year. and those in Maine have nearly \$41,000,000.

Reports from European consuls show that emigration to America, especially from Scandinavian countries, has been greatly stimulated during the year by fears of an exclusion act applicable to white people as well as to Mongolians. Designing agents improved their opportunity.

The iron foundry firm, Handren & Robbins, of this city, are converting the merchant steamer Madrid into a warship for the Haytian navy, by protecting her sides with a heavy lining of iron plates and oak, cutting holes in her iron bulwarks for guns, &c. It is generally understood that she was purchased for Hippolyte, and will obtain, perhaps from France, a number of heavy guns. An editor facetiously remarks that if the guns are fired the crew hope to swim ashore before the ship sinks from the effects of the recoil.

It is now stated on the authority of a Sheffield paper that English capitalists are about to submit definite proposals for a gigantic salt trust, to comprise all manufacturers in England, the United States and Canada, the agreement to hold good for ten years, with promised dividends at the rate of 25 per cent. per annum.

Work is to be begun in the spring on a dam 48 feet high across the Klamath River, which is to afford water-power for a number of new saw mills not far from the California and Oregon line, in Shasta County. An Eastern syndicate, in which General Alger, of Michigan, is interested, is behind the scheme, and the capital is said to be \$10,000,000.

Disston Hall, in Philadelphia, so called because the Messrs. Disston, the well-known manufacturers of that city, were the largest contributors, was formerly opened on the 6th inst.

Senator Stanford, of California, says that the free sugar under the Hawaiian treaty retarded the growth of the beet sugar industry on the Pacific Coast, but that improved machinery brought from Germany has given an impetus to it, which now promises to make it the most important industry on the Pacific Coast.

The boom in ocean freights originated in the petroleum trade about three months ago. The demand for tonnage has increased until at present rates received by owners and agents are almost doubled. It is stated that sailing vessels adapted for cargoes of grain, which were valued in June last at \$30,000, can now be sold for \$40,000 and \$50,000. Petroleum ships, whose best selling prices before the boom got under headway were \$10,000 and \$12,000, are now quoted at \$20,000 and \$25,000. One effect is to stimulate ship-building everywhere, particularly in England.

A steel boat with air-tight compartments has been ordered by the Union Ferry Company for the Hamilton Avenue Line.

California last year produced 17,000,000 gallons of wine, an increase of 1,000,000 gallons over the previous year. Of the total at least 4,000,000 gallons will be distilled, producing about 600,000 gallons of brandy. The balance of 13,000,000 gallons will consist of dry and sweet wines. During the past year over 7,000,000 gallons have been exported, including 400,000 gallons to foreign countries.

A suit begun in the United States District Court, at St. Paul, on behalf of the Government, against the Northern Pacific Rail-

road Company involves over \$5,000,000, which is said to be the value of timber unlawfully cut by the company in parts of Idaho, Washington Territory, Montana and Minnesota.

The Keely bubble, the Panama Canal bubble and the Electric sugar bubble, if not myths are memorable.

The Lehigh Valley Railroad are building five piers at their new terminal in Jersey City each 600 feet long, covered with corrugated sheet iron.

The Dominion Government has granted another order permitting roads in Manitoba to cross the Southwestern branches of the Canadian Pacific Railway, indicating that Manitoba has gained a decided victory in its long struggle for the exercise of this right.

Four of the seven men who originally founded the Knights of Labor have addressed a circular to the organization at large, declaring that the officers now in power have departed from the principles transmitted to them and inviting communications from "all who believe in the principles formerly promulgated—to wit, secrecy, obedience, mutual assistance, and the placing of industry on a scientific basis." This is understood to be a blow aimed at Powderly.

In a single day quite recently nine large steamers, comprising 22,775 registered tonnage, cleared from New York for ports in the United Kingdom.

The value of the cotton goods made in the South was \$21,000,000 in 1880, and nearly \$50,000,000 for 1888. In 1880 there were 40 cotton-seed oil mills in the South. Now there are 160, with about \$12,000,000 invested. The value of the South's agricultural products for 1888 was about \$800,000,000, against \$571,000,000 in 1879. The value of the South's live stock is now \$570,000,000, while in 1879 it was \$391,400,000. The production of grain rose from 431,074,630 bushels in 1880 to 626,305,000 bushels in 1887, an increase of nearly 200,000,000 bushels.

The business of the New York State canals, during the season of 1888, shows the effects of a decreased export trade and sharp railroad competition. The total tonnage was 4,942,948, a decrease of 610,857 tons compared with the previous year.

An Englishman, who formerly resided in San Francisco, has extensive works a few miles from Valparaiso, in Chili, from which there have been turned out lately half a dozen locomotives for the State railways at a cost of about \$21,000 each in gold. The steel used is imported from England and the pig iron for castings from Scotland, while the wood-working machinery was made in the United States.

C. T. Yerkes, President of the Cable Railways in Chicago, says that the cable will supersede everything else as the motive power for street railways, that it is much superior to electricity, and can be operated at a far less expense than electric roads, in a short time more than compensating for the difference in the cost of construction. Chicago will soon have a cable line 27 miles long.

The building records of New York City show that, exclusive of alterations, the expenditures during the past year for new constructions amounted to \$46,900,000, as compared with over \$67,000,000 in 1887. The number of buildings erected was 3073, against 4374 in 1887, and of the total 25 ranged in cost from \$1,000,000 to \$450,000. The most expensive building in progress is the new publishing house of the Methodist Book Concern, at Fifth avenue and Twentieth street, which will cost \$500,000.

MANUFACTURING.

Iron and Steel.

The Clinton Rolling Mill, on the South Side, Pittsburgh, formerly operated by Graff, Bennett & Co., but which for some months has been operated by the assignees of that firm, was closed down for an indefinite period on Saturday, the 5th inst. The Clinton blast furnace was also operated by the assignees, and the pig iron made by it was worked into muck bar in the rolling mill. The furnace produced about 50 tons of pig iron per day. It will also be blown out during the present week indefinitely. James M. Bailey, who is one of the assignees, when questioned as to the cause of the shut down, refused to give any reason therefor, but it is understood that the plant has not been making any money since it was put in operation. The Millvale Rolling Mill, also operated by Graff, Bennett & Co. previous to their failure, has been idle for months, and from present indications will remain in that condition for some time to come.

The Detroit Spiral Tube Company have been organized at Detroit, Mich., with a capital stock of \$100,000, to manufacture metallic tubes, tanks, reservoirs, and pressed sheet and plate metal work.

No. 3 furnace of the Pennsylvania Steel Company, at Steelton, Pa., which is undergoing repairs at present, will be ready for blast in a few days.

From a recent issue of the Akron, Ohio, *Beacon* we take the following information regarding operations at the plant of the Akron Iron Company, of that city: "The Akron Iron Company now employ 400 hands—300 in the rolling mill and 100 in the shafting department—an increase of about 25 over 1887. The aggregate output of the works is 1000 tons per month, and the present business outlook indicates that the products of the mill will be increased 33 per cent. Several thousand dollars have been expended the past year in improving the plant. The most important betterment is the erection of three upright tubular boilers—two of 150 horse-power each and one of 215 horse-power—of the celebrated Hazleton make, which were placed in position under the supervision of S. E. Keller, directing engineer. These boilers are so constructed that each becomes a stack for the furnaces, and the waste heat of the furnaces is utilized in generating the steam for running the engines and machinery of the mill. These boilers displace the old plant, which has done service for many years, and will save several thousand dollars annually in the cost of fuel. In the shafting department the company have added 25 tons of new machinery. A 250 horse-power engine, milling machinery, a lathe and a straightener are betterments greatly enlarging the capacity of the shafting works. During the year a frame building 36 x 150 feet in diameter has been built to the shafting department. The opening of a branch store in Boston, Mass., for the handling of the product of the polished shafting works has been decided upon, and will be established soon."

The Linden Steel Company, Limited, of Pittsburgh, have entered into an arrangement with Ripley & Bronson, of St. Louis, by the terms of which the last named firm will have the exclusive sale in the West and South of the steel plates made by the Linden Company.

On the 1st inst. the Bellaire Nail Works, of Bellaire, Ohio, declared a cash dividend of 5 per cent. out of the earnings of the past six months.

The Beaver Valley Mfg. Company, Limited, manufacturers of steel and malleable iron castings, have commenced the erec-

tion of a Swedish heating furnace as an experiment. If it proves successful the company will probably erect additional furnaces.

The Victoria Iron Furnace and Mines, located at Goshen, Va., on the line of the Chesapeake and Ohio Railroad, with a capacity of 200 tons of iron daily, owned by an English syndicate, have been leased by the attorneys of the company to Chamberlain, Wheeler & Co., of Columbus, Ohio. The plant will be put in operation at once.

The extensive foundry of the Reading Foundry Company, in Reading, Pa., where large iron pipe for gas and water mains for many of the large cities is made, closed down for an indefinite period, throwing 160 men out of employment. Dull trade is given as the cause for closing the works.

The Trumbull Iron Company, Girard, Ohio, has commenced work on another addition to the puddling department of their mill, and a number of new puddling furnaces will be erected. When completed they will have 27 puddling furnaces in operation. An addition will also be built to the boiler-house.

The Canton Steel Roofing Company, Canton, Ohio, have nearly completed an addition to their shops 90 x 75 feet and two stories high, making the size of the entire buildings 90 x 200 feet. The offices of the company will be located in the new structure.

The employees of the iron mill of Carnegie, Phipps & Co., Limited, at Beaver Falls, recently operated by the Hartman Steel Company, Limited, have been notified that a brief shut down will be made in order to change the machinery. As soon as the proposed changes are made a new system will be adopted by the company which will reduce the force very considerably. All the employees who do not wish to work under the new system have been notified that they will be paid off in full by applying at the office. The workmen claim that the change will result in a reduction of wages, but this is denied by the firm, who say the men will make as much as before.

It is reliably reported that the Wellston Furnace Company, of Wellston, Ohio, composed of J. C. Clutts and L. J. Morgan, of that place, and Hyde, Forsyth & Co., pig iron merchants, of Chicago, have purchased the Wellston Furnace with 13 acres of ground for \$36,000. Work has already been commenced at repairing the stock. This furnace was formerly operated under lease by King, Gilbert & Warner, of Columbus, who surrendered the lease some months since.

The Booth Iron Mixture Company have been organized at Baltimore, Md., with a capital stock of \$125,000, to manufacture, sell and use compounds for improving the quality of steel in any form while in process of being manufactured.

The rolling mill and nail factory of the E. & G. Brooke Iron Company, Limited, at Birdsboro, Pa., which has been closed down for several weeks undergoing repairs, resumed operations again last week.

No. 1 Furnace of the Andover Iron Company, at Phillipsburg, N. J., produced in one week last month 800 gross tons of gray forge pig iron on a fuel consumption of 1.11 tons per gross ton of iron made. The fuel mixture consisted of three-fourths anthracite coal and one-fourth coke.

The entire plant of the Wheeling Steel Works, at Wheeling, W. Va., closed down on the 1st inst. for an indefinite period for the purpose of making repairs and taking stock. The plant was in operation 21

days last month, during which time 8822 net tons of steel were produced.

The entire plant of the Scranton Steel Company, at Scranton, Pa., has been closed down.

The Canton Steel Works, at Canton, Ohio, have been bought by Pittsburgh parties for \$200,000. The new firm is to be known as the Bolton Iron and Steel Company.

Machinery.

The Kilby Mfg. Company, of Cleveland, Ohio, are running night and day on heavy work for paper mills and cable roads. One digester for paper stock is made of leaf bronze, 7 feet in diameter, 22 feet long and weighs 30,000 pounds. It is cast in five sections. The cable road work goes to the Pacific coast, and one order will make 65 carloads.

The Acme Machinery Company, Cleveland, are building a two-story brick machine shop, 50x120 feet; also a separate L 32x40 feet, to connect the new shop with the present one. The L is to be three stories high. The lower story will be used for offices and toolroom, and the second story for stock room, and the upper story for drafting-room. The company started in business four years ago, to manufacture the Acme bolt and screw cutter, employing six hands. At present they employ 54 outside the foundry.

The Webster, Camp & Lane Machine Company, manufacturers of engines, hoisting drums, &c., at Akron, Ohio, are at present giving employment to 140 men. The product of the plant for the year just closed aggregates \$175,000, an increase of 15 per cent. over the previous year. During the year 1888 the firm made 70 engines, ranging from 15 horse-power to 300 horse-power, and 55 hoisting drums, from 4 feet to 10 feet in diameter. The firm recently received an order for three hoisting drums, each 11 feet in diameter, with a capacity of 1500 feet of cable and weighing over 100 tons, an automatic engine of 300 horse-power, a complete plant of boilers, with stack and fixtures, also "skips," "sheaves" and wire rope, all to be used in connection with the hoisting machinery. The above order also includes three hoisting drums, each 10 feet in diameter, 1500 feet of cable, and a 300 horse-power automatic engine. The firm is at work upon two engines for the Union Strawboard Company, at Anderson, Ind. The engines are each 300 horse-power, with cylinders 28x48 inches in size, and both will propel an enormous belt wheel 20 feet in diameter, weighing 45 tons.

Messrs. Riehl Bros., proprietors of the Philadelphia Scale and Testing Machine Works, Ninth and Master streets, report the following recent orders: One 100,000-pound vertical testing machine, sold to the Union Switch and Signal Company, Pittsburgh, Pa.; one 100,000-pound U. S. standard cement testing machine, Rock Island Arsenal, U. S. A.; Rock Island, Ill.; one 2000-pound U. S. standard cement testing machine, to the U. S. Quartermaster Department, Fort Riley, Kan.; one 4000-pound screw-power testing machine to the Nebraska State University, Lincoln, Neb.; one marble molding and countersinking machine, to Baterson, See & Eisele, New York; one ditto to R. Forsyth, Thousand Island Granite and Marble Works, Montreal, Canada; one coal hopper scale, Manufacturers' Club, Philadelphia; one 10-ton wagon scale, with platform, 22 feet long, Messrs. Haines & Thomas, Malvern, Pa.; one 6-ton scale, W. A. Levering, Atlantic Heights, N. J.; 1 ton of the U. S. standard testing weights, Woodstock Iron Company, Anniston, Ala.; 1 ton ditto, to the State Line and Sullivan Rail-

road, Bernice, Pa.; one 50-ton self-adjusting track scale with rocking bearings, E. P. Allis, Milwaukee, Wis.; one 5000-pound foundry tester, Rogers, Brown & Co., Cincinnati, Ohio; one 5000-pound transverse testing machine, United States Rolling Stock Company, Hegewisch, Ill.; one furnace charging scale, Merion Iron Company, Conshohocken, Pa.; two Clarke patented ventilating fans, McNeely & Co., Philadelphia; one ditto, Rathbun Company, Deseronto, Canada. Orders coming in freely and the outlook never better.

Ranken & Fritch Foundry and Machine Company say they are well filled up with orders, so much so that they are running a night and a day force. They are particularly busy on the following class of work: Corliss piston and slide valve engines, plate glass machinery, steam and hydraulic elevators, mining machinery, &c. They will ship during the present month between 40 and 50 carloads of machinery to different parts of the United States and Mexico.

Shultz Belting Company are running full time, and judging from the number of orders already received the present month will be a very busy one. Their trade is not confined to any particular locality, but wherever belting is used, throughout the United States and Mexico.

A Chicago office has just been opened by the Saginaw Mfg. Company, of Saginaw City, Mich. This firm manufacture the well known Gilbert universal wood split pulley.

The works of the Parish Mfg. Company, of Chicago, manufacturers of saw mill machinery, steam engines and power transmitting machinery—have been removed to Ashland, Wis.

The Smith-Hill Foundry and Machine Company, of Quincy, Ill., have issued a new catalogue, dated 1889, and devoted to their engines, pumps, heaters, boilers and other manufactures. It is profusely illustrated and gives comprehensive descriptions, price lists and tables of dimensions.

The Watertown (New York) Mfg. Company having agreed to remove their plant to Dayton, and claiming to employ 600 men, \$50,000 bonus required has been subscribed for their encouragement.

At East Liverpool, Ohio, January 3, the foundry, machine shop and pattern room of A. J. Boyce were totally destroyed by fire.

The Marr Construction Company, located in the Bissell Block, Pittsburgh, have received through their New York agents a large contract for lighting the streets of a town in the interior of Brazil, South America. The contract calls for 1500 lights of 32-candle power. The Westinghouse system will be used and two engineers will be sent from Pittsburgh to superintend the erection of the plant and remain on the ground until it is in good working order. 35 miles of working cable wire will be used, which has already been shipped to Rio Janeiro by the Standard Underground Cable Company, of 708 Penn avenue, in that city.

The Lewis Foundry and Machine Company, Limited, of Pittsburgh, are now engaged in the erection of a 12-inch merchant train, together with the engine and rolls, for the Horseshoe Machine Company, of Anniston, Ala., besides various other contracts in different sections of the country.

The Aetna Machine Company, of Warren, Ohio, have received a contract from the American Wire Nail Company, of Covington, Ky., for the building of a 600-horse-power engine, complete with boilers, heaters, pumps, &c. The new engine is

to drive the new rod and nail mill which the latter company are now building at Anderson, Ind.

Hardware.

The McCosh Iron and Steel Company, Burlington, Iowa, having decided to add wire drawing to their business, are having put in a 50-block mill and a new 250 horse-power engine. The latter will be furnished by the Murray Iron Works, also of Burlington.

The LePage Company, in order to meet the increasing demand for the improved process glues manufactured by them, have been compelled to increase their manufacturing capacity, and instead of again enlarging their present works at Fort Point have bought out and consolidated the Dole Fertilizer Company and Red Star Mfg. Company, of Boston, having factories at Spectacle Island, in Boston harbor, for the manufacture of fertilizers, desiccated fish, poultry food, &c. To these works they are now adding a new glue plant, in which they can produce as much glue as in their present works, thus doubling their capacity in this branch, while in the manufacture of fertilizers, &c., they find use for all their waste material, which will afford them a much better margin of profit than could be realized by selling it to outside parties. The company have chartered the steam lighter Jesse James, which will ply between the works at Spectacle Island and Gloucester and the company's storehouse at Comey's wharf, Boston. They have also secured commodious offices at No. 50 Central street, Boston, where the general business of the company will be transacted. The new management will be: President and general manager, Wm. N. LePage; vice-president, S. Henry Hooper; treasurer, Guy Wilkinson; secretary, C. M. Martin.

On Saturday, the 5th inst., the employees of Hussey, Binns & Co., Limited, the well-known shovel manufacturers, at Pittsburgh, presented their manager, F. B. Newton, with an elegant gold watch and chain. The gift was presented to Mr. Newton by the employees as a slight token of the esteem in which he is held.

During the year 1888 the Lenz Wire Nail Company, of Belleville, Ill., erected a new wire nail plant, which has been in successful operation since April last.

The Missouri Refrigerator Mfg. Company, St. Louis, with a capital stock of \$10,500, has filed notice of incorporation. Thos. A. Walker, J. J. Simmons and Otto Brinkmeyer own the stock in equal parts.

The Lima Lock Mfg. Company, recently organized at Lima, Ohio, commenced operations at that place on the 2d inst. The company have rented buildings temporarily and will erect their own works early in the spring months.

Miscellaneous.

The Juniata Limestone Company, with a capital stock of \$25,000, was organized at Hollidaysburg, Pa., on the 29th ult. The officers are: J. King McLanahan, Hollidaysburg, president; Lovell Baldrige, Hollidaysburg, secretary and treasurer; directors, John Manning and Thomas B. Lewis, Hollidaysburg, and C. A. Woods and John Bingaman, Altoona. The chief offices of the company will be located at Hollidaysburg. The quarries are on the Williamsburg Railroad, about 18 miles distant.

The St. Charles Car Company, of St. Louis, contemplate an increase of their capital stock to \$1,000,000, in order to extend their manufacturing facilities.

The Ohio Falls Car Company, of Jeffersonville, Ind., built last year 2150 cars, of which 157 were for passenger service. It

is expected that the output for this year will be more than double the output of last year, as the larger portion of the past year was taken up in making extensions and improvements in the shops.

The new Edison Electric Company will erect works in East Orange, N. J., with offices in leading cities and States, with a paid up capital of \$1,000,000.

The American Steel Barge Company, of Buffalo, capital, \$500,000, has filed a certificate of incorporation.

Among recently authorized corporations in Illinois are the following: H. W. Trowbridge & Co., Chicago; capital, \$100,000; to manufacture structural and ornamental metal work; incorporators, H. W. Trowbridge, Byron A. Baldwin and George C. Fry. The Northwestern Expanded Metal Company, Chicago; capital, \$100,000; to manufacture metals; incorporators, Oscar Bradford, Alfred Russell and William M. Ramsey. East Chicago Foundry Company, Chicago; capital, \$250,000; incorporators, Edward L. Lumb, Sohas Burns and Thomas E. Dixon. The Calumet Iron and Steel Company have filed a certificate for the increase of their capital from \$2,000,000 to \$2,200,000.

The United States army, according to the last report of the Major-General commanding, was divided as follows:

	Officers.	Enlisted men.
Generals.....	9	.....
General staff.....	574	1,971
Ten regiments of cavalry...	427	6,842
Five regiments of artillery.	283	2,437
Twenty-five regiments of infantry.....	885	10,563
Indian scouts.....	....	197
Detachments, recruiting parties, &c.....	....	2,539
Total.....	2,188	24,549

The electric subways built in many parts of New York City at a heavy expense are declared by President Lynch, of the United States Illuminating Company, to be useless. He affirms "that the only cable placed in the subways was made by a well-known manufacturer, and they have never been able to pass a current through it. Whether it is a defect in the cable or a defect in the construction of the subway remains yet to be proved." Mr. Lynch contends that building a tunnel, with wires strung overhead is the only practicable way of placing wires underground.

The manufacturers in some parts of the country claim advantages in items of cost over their competitors located at other points. It is stated on the basis of investigations made by Secretary D. M. Thomas that the cost of manufacturing stoves does not necessarily vary 2½ per cent. in the different parts of the country now having a stove industry. Such advantages as one point possesses are offset by other advantages in favor of a competing point. Into such a comparison the cost of distribution does not enter. Nor does the question of natural markets come up for consideration.

Assistant Secretary Maynard has informed the Collector of Customs at Erie, Pa., that prepaed or crushed asbestos, such as is generally used in the manufacture of asbestos cement, asbestos mica, asbestos sope steam packing, &c., is dutiable at the rate of 25 per cent ad valorem under the special provision for "asbestos manufactured," and that under no circumstances can asbestos be classified under the provision of the free list for "paper stock."

The Dominion debt increased last year \$11,326,000, and now amounts to \$284,500,000.

The Iron Age

New York, Thursday, January 10, 1889.

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF, JR., - EDITOR.
GEO. W. COPE, - - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS, - - - HARDWARE EDITOR.
JOHN S. KING, - - - - BUSINESS MANAGER.

The Cut in Beams.

On Monday the members of the Beam Association held a meeting in this city in which it was decided to reduce the price of beams and channels from 3.8 cents to 2.8 cents, a cut of half a cent a pound. The considerations which led to so radical a reduction in price were numerous. For some time past the trade has been discussing the probability of the withdrawal of one of the leading firms of the association. The principal partner in the concern has expressed himself publicly and privately as an opponent of trade combinations, and has acted in accordance with that opinion in two cases where a concern with which he is identified was a member of an association the purpose of which was to establish prices. This was widely known in the trade, and the question was freely discussed whether a withdrawal from the beam combination would follow.

It is stated that one concern, making between 40 and 45 per cent. of the whole quantity of beams produced by the members of the association, and which was annually paying considerable sums of money for exceeding its allotment, made a claim for a larger percentage. It is understood that while this claim was resisted vigorously in some quarters, it was finally partly acknowledged to be valid. It appears that a year since a similar demand was waived, but that the business of the past 12 months has substantially proven its justice. Other elements of discord or disagreement, which always crop up at gatherings of this kind, were eliminated.

There are seven members in the association—the Passaic Rolling Mill Company, of Paterson, N. J.; Cooper, Hewitt & Co., of Trenton, N. J.; A. & P. Roberts & Co., Pencoyd, Pa.; Phoenix Iron Company, Phoenixville, Pa.; Pottsville Iron and Steel Company, Pottsville, Pa.; Jones & Laughlins and Carnegie, Phipps & Co., of Pittsburgh. Outside of the combination there are the Allentown Rolling Mill Company, of Allentown, Pa., making only small beams; the Columbia Iron and Steel Company, of Uniontown, Pa.; and the North Chicago Rolling Mill Company, of Chicago, Ill. The product of the mills in the association is estimated at about 75,000 tons during 1888, which is somewhat less than it has been in the previous year. It is believed that the outside mills may have turned out 10,000 tons in 1888, while at least 5000 tons were imported. It is the competition from these two sources, and the danger that in the present condition of other lines others may enter the business, which has probably led to the putting down of the price to which we have alluded. The market in Boston and its vicinity has been almost entirely in the hands of foreign makers, and some large lots have gone into this city, and other

Atlantic, Gulf and Pacific ports. With a growing output at home, and the constant cutting of prices by outside mills, the maintenance of the 3.8-cent rate has been wisely held to be untenable.

Since the steel rail trade has been cut to pieces, and other departments of the iron industry have become unremunerative, manufacturers in other branches have looked longingly upon the alleged enormous profits of the beam makers. They have probably only been deterred from entering it by the knowledge that it requires a working capital out of all ordinary proportion to the tonnage of product, and that it takes long and costly experience to become successful in the business. These facts afforded the makers a protection against new rivals which no other branch of the iron and steel trades can well boast of, but it was evidently recognized that it would not prove adequate at a time when margins all around had been cut down to the narrowest limits. The members of the association all have the advantage that they produce, besides beams and channels, other forms of structural iron and steel, and some of them are closely allied to bridge concerns or are themselves bridge builders. It is this, too, which gives them advantages over those who might be inclined to enter into the manufacture of beams. On the whole the step taken by the beam association will be recognized as being judicious. It is certain to discourage any further accessions to the numbers of producers and is likely to stop any attempts to build new works with the object of forcing the association, after a brief fight, to take in the newcomer. The fact that none of the mills outside of the combination have been allowed to enter it indicates that the association feels secure in its position.

The Rights of Shippers.

At the late meeting of the Boston Business Men's Association some resolutions of general interest were adopted. These were: 1. That common carriers should deliver the goods and quantity received for, or pay for same without litigation; 2. That all merchandise should be delivered to the consignee on payment of the freight charges as specified in the bill of lading, and, 3. That "owner's risk" should be eliminated from the classification except as regarding perishable goods. These three resolutions are sound in principle, commercially just, and their practical application should be insisted upon by business public opinion.

Our bills of lading are hedged about with every known device of language for avoiding payment of losses. Unquestionably many of these stipulations are only fair to the carriers, such as releasing them from liability for damages caused by the act of God; but others work hardships to the patrons of the railroads. One of these is the burden thrown upon the shipper to find out what particular road of a line may have lost his case of hardware, because his bill of lading says that particular road only is responsible. In England the road issuing the bill of lading is responsible to destination, the theory being that it is in a better position to find the offending part of the line and arrange a settlement than is the shipper. But this is not so in the

United States. Again, part of a shipment may go astray and perhaps not be found for months. How long should the shipper wait before expecting payment? Abroad the time allowed to find the goods is limited by law, and after that time they are considered lost and must be paid for. In America it is not legislation so much as public opinion expressed through business associations that we need.

Something of the same reasoning applies also to the resolution requiring delivery of goods on tender of the exact charges specified in the bill of lading. It is a common source of annoyance to merchants to find that they often cannot obtain their goods without payment of a sum considerably in excess of the rate agreed upon and distinctly stated in the bill of lading. The delivery agent can only say that somebody has made a mistake, that he cannot rectify it, and that the only way is for the shipper to pay the additional amount and put in a claim for it. This latter means a delay of months, or even years. There seems no good excuse for it. The delivering road in collecting the charges acts as agent for all the roads in the line, and surely should be trusted to fulfill the contract rate of the whole line. That somebody made a mistake is not a sufficient reason for overcharging the customer. If anybody should be out of pocket during the investigation and settlement of the error it should certainly be the railroad who made the mistake or its agent, and not the innocent consignee. It is not disputed that the rate is a contract and is binding, only the carrier takes it upon himself not to live up to it. In the States of Texas and Arkansas there are laws compelling the acceptance of the bill of lading charges, and upon all the honestly managed railroads an effort is made to pay such overcharges promptly, but the point made by the Boston association is that they should not have occurred in the first place.

On the third resolution it may be said that "owner's risk" is primarily an insurance. The charge for it should be enough to cover this insurance and perhaps something more to discourage doubtful packing and the like. Practically in a great many cases the charges at carrier's risk are double the rates at owner's risk and far beyond any insurance premium. Then many goods are taken only at owner's risk, no option being offered. This is of doubtful legality. In some articles, like liquids, the clause is intended to shield the carrier from the chances of leakage. In general it may be said that the courts have upheld any stipulations of the bill of lading which released the carrier from losses which might have happened to the goods had they remained in owner's warehouse. To all this there is one great exception—negligence in any way upon the part of the railroad or its employees. This would be an important exception to all shippers but for the unfortunate fact that such negligence can only be proved through the railroad people, while the burden of showing such carelessness in handling or stowing in the cars rests upon the owner, who finds such proofs well nigh impossible to obtain. The matter of thus shifting all risk upon the shipper has been carried too far. The subject needs a careful study and the tariffs a thorough revision. Then, too, we need a change in the burden of proof. Every carrier should be held liable for this damage,

unless he can affirmatively show that the loss arose from the nature of the article and not from his own negligence.

Cost Formulas.

It scarcely needs argument at the present time to convince manufacturers that an adequate system of cost accounts is one of the most essential parts of their business management. There are very few establishments indeed that do not have some plan or other for computing the cost of their manufactured product. Modern manufacturers are not satisfied to know at the end of the year that they have made or lost money, but must have for guidance during the year's business such reports of their operations as will show that they are either making or losing upon their daily transactions. While manufacturers at large, including members of the stove industry, are fully convinced that cost accounts upon some adequate basis are essential, it still remains that there is no uniformity of plan among them. The advantages of uniformity in matters of this kind, particularly where men are seeking trade under the same conditions and in the same territory, and where they occasionally come together for conference and comparison of results, is of the greatest importance.

A committee was appointed some time since by the president of the National Association of Stove Manufacturers to give the question of uniform cost accounts in the stove business careful attention. The idea in view was to formulate such a plan as would be acceptable to the majority of those in the trade and to urge the adoption of the plan in preference to others, not only on account of the advantages which it might possess in itself, but more particularly because uniformity in such calculations would be a great advantage to the trade at large as well as to individual manufacturers. The committee appointed for this purpose consisted of the following gentleman: Lazard Kahn, of Hamilton, Ohio, chairman; Francis Kernan, Jr., Utica, N. Y.; J. W. Van Cleve, St. Louis; Frank A. McGee, Boston, and W. H. Phahler, of Philadelphia. Secretary D. M. Thomas has worked with great energy the past few months in furthering the special work of this committee, and has drawn largely upon his special experience as an accountant. A very complete formula has been prepared which has been subjected to the scrutiny and criticisms of a large number in the trade, and last week the committee met in Chicago, and in a three-day session gave the final revision to the work. The formula will be issued to the trade, we are informed, without delay. It provides a plan by which costs can be accurately determined on individual articles as manufacturing operations progress, and provides also for proper distribution of general expenses. This formula is to be submitted to the National Association at its next annual convention for discussion and adoption. Whatever comes of the committee's work, there will be at least this good accomplished: the attention of manufacturers will be directed more carefully than ever before to the question of cost, and the influence of this alone will be of great benefit.

Late Events in Hayti.

During the nine years of President Salomon's administration Hayti probably flourished more than it had ever done. The finances improved, monetary affairs were placed on a solid footing, attempts at revolution were suppressed and peace was maintained between the blacks and mulattoes. During the last three years of his administration the value of coffee, of which the Haytians produce in ordinary years 50,000,000 pounds, rose considerably, and stayed there most of the time, spreading prosperity throughout the island. This happy change enabled the people to extend their business relations with foreign countries, the largest share falling to American trade. Last year, after General Salomon's death in exile at Paris, several ambitious generals strove, each for himself, to obtain the presidency or dictatorship from competitors under the cloak of a provisional Government. No decisive encounters between the contending revolutionary leaders have as yet taken place, but both now in the field have been marshalling their forces and importing arms and ammunition. The southern faction has blockaded, and, to a moderate extent, shelled, northern ports, on which occasion the steamer Haytian Republic, under the American flag, was seized, but later was surrendered to the peremptory demands of our Government backed by a naval force. How long anarchy is going to last in Hayti there is no means of judging; it is to be hoped in the interest of the people at large that either the one or the other of the two factions may soon prevail, so that the coffee crop may be gathered and shipped and be converted into provisions, which are getting very scarce on the Haytian coast.

Hayti, the western third of the island of St. Domingo or French portion, covers an area of 28,000 sq. km., and, as per census of 1887, was then inhabited by 960,000 blacks and mulattoes. During the Salomon régime the public indebtedness had been reduced to \$4,320,000 foreign debt, and \$9,180,000 home debt, together \$13,500,000. The income was \$6,412,957 in 1885-86, covering an outlay equal in amount. The expenditure for 1887-88 was estimated not to exceed \$4,066,236. The army was reduced to 6828 men, rank and file. The navy consists of two war steamers, one of which is armored and mounts four guns. Hayti's postal service in 1886 was attended to by 31 post offices, handling 233,872 letters and postal cards, 7520 registered letters and 181,520 newspapers and sample packages. The receipts were 69,200 francs, and the expenses 137,125 francs.

Hayti imported in 1887 \$6,854,597 worth of merchandise, exporting \$10,185,366 worth of products. Of the latter there was coffee, 49,811,781 pounds; logwood, 227,595,803 pounds; cocoa, 3,634,860 pounds, the remainder consisting of hides and skins, fustic, lignum vite, honey, cotton seed, tortoise shell, mahogany, wax, old copper, orange peel, &c. Together with planters and export merchants, the Government during the Salomon régime strove to improve the quality of coffee by establishing cleaning mills, &c., in the suburbs of leading ports. Formerly small stones and pieces of lime were often found mixed with the coffee, but now this rarely

happens, and, as a consequence, it brings higher prices.

American trade with Hayti for 1887 and 1888 shows the following figures:

Fiscal year.	Import.	Domestic export to Hayti.
1888	\$2,918,820	\$4,322,653
1887	1,752,537	3,059,318

Increase..... \$1,166,283 \$1,263,335

Increase in total trade, 50 per cent.

The vessels that entered at leading ports in 1887 were:

	Ves-	Ton-	Ves-	Ton-
	sels.	nage.	sels.	nage.
Cape Hayti.....	236	239,357	163	180,651
Port-au-Prince.....	227	246,014	146	225,754
Gonaïves.....	134	111,244	83	100,116
Aux Cayes.....	99	94,636	71	87,777
Totals.....	726	691,150	463	594,298

American trade with Hayti is carried on chiefly from New York, and has at all times been paying the commission firms engaged in it well, so far as occasional bad debts would permit, especially in revolutionary times. It was in an unusually flourishing condition when the present troubles broke out.

The Wire and Allied Trades.

The wire trade in its different branches has been conspicuous lately for a very unsatisfactory state of affairs. The great barb-wire industry with its enormous consumption has suffered for months past from a cut-throat competition in which values based on cost have been lost sight of. Prices have been lower than ever before in the history of the trade. In wire nails a period of low prices followed the brief sway of a combination which has now gone to pieces, with little prospect of an early renewal, and has left the trade with great uncertainty as to values. In market wire manufacturers have been forced to be content with very small returns considering the magnitude of the business done, the only branch in which profits have been adequate being in wire rope.

It is stated, and there seems to be some grounds for this assertion, that one of the causes for the condition of affairs alluded to is the contest for supremacy on the part of the larger concerns which control wire-rod mills. The unit of capacity is about 2500 to 3000 tons a month with a modern wire-rod mill. Though a moderate quantity with a steel mill, it is a very large amount when viewed from the standpoint of a maker of barb wire, of wire nails or of market wire. A concern possessing one or more rod mills, and at the same time producing the articles named ready for the consumer, must naturally follow a somewhat different policy in marketing goods than a small mill. It will often make sacrifices to keep up tonnage to secure at least a part of the advantages which steady employment confers. To this general tendency comes an additional incentive in the case of wire works with rod mills in the West. With prices of billets ranging, as they have done for some time past, at \$28 to \$29, a rod mill can produce wire rods at a small profit at about \$40, the reports of cost made by a number of leading mills last year showing figures ranging between \$8.54 and \$9.95 per ton. Now, domestic wire rods have sold in the open market west of the Allegheny Mountains considerably over

\$40 during the past six months, so that the concerns owning rod mills could readily place barb wire or wire nails on the market at cost or even less, based on the market price of wire rods, and yet make a fair return on the capital invested on the entire plant. The policy of accepting a moderate return on the entire tonnage of finished product has been openly avowed in one conspicuous instance. However much individuals may differ on the expediency of such a course, its adoption even in isolated cases by influential concerns is important enough to force it into prominence with the trade. We are far from believing that there exists an irresistible tendency toward throwing the control of a large industry like the wire trade into the hands of a few corporations or firms. But it is unquestionably true that in times of depression the makers who are able to secure a profit on what is raw material to smaller rivals have a very decided advantage. In the case of the wire trade the Eastern mills dependent upon foreign rods are under a particularly severe strain.

Pig Iron Production in 1888.

From our monthly blast furnace reports we have compiled an estimate of the production of anthracite and coke pig iron. While we cannot claim for it absolute accuracy, it is sufficiently close to deserve consideration, since the number of the furnaces from which we have no official data can be counted on one's fingers. We may repeat in this connection that we have followed the general principle, in compiling our monthly blast furnace returns, of being guided entirely by actual product. When a furnace has run over a long period, six months or more, with fair regularity, we accept the weekly product as the normal average. When a gradual increase has taken place we adopt the average of the last two or three months. When there has been a notable falling off, indicating that the furnace is not working up to standard, we modify the figure accordingly.

Our returns from the anthracite furnaces show the following for the second half of 1888:

Production of Anthracite Furnaces, Second Half 1888.

New York.....	72,699	gross tons.
New Jersey.....	42,578	" "
Pennsylvania:		
Lehigh Valley.....	252,523	" "
Schuylkill Valley.....	157,776	" "
Upper Susquehanna Valley.....	76,180	" "
Lebanon Valley.....	174,357	" "
Lower Susquehanna Valley.....	122,190	" "
Total.....	898,803	" "

Our grouping of districts differs somewhat from that adopted by Mr. James M. Swank, secretary of the American Iron and Steel Association.

We estimate the production of coke pig as follows:

Coke Pig Production, Second Half 1888.

New York.....	29,770	gross tons.
Pennsylvania:		
Pittsburgh District.....	405,102	" "
Shenango Valley.....	238,960	" "
Juniata and Conemaugh Valley.....	148,276	" "
Youghiogbeny Valley.....	37,969	" "
Miscellaneous.....	30,047	" "
Maryland.....	3,000	" "
West Virginia.....	45,478	" "

Ohio:		
Mahoning Valley.....	198,581	gross tons.
Central and Northern.....	235,368	" "
Hocking Valley.....	40,767	" "
Hanging Rock.....	40,103	" "
Indiana.....	7,291	" "
Illinois.....	254,974	" "
Wisconsin.....	23,317	" "
Missouri.....	13,739	" "
Colorado.....	10,000	" "
The South:		
Virginia.....	91,442	" "
Kentucky.....	34,486	" "
Alabama.....	209,721	" "
Tennessee.....	110,821	" "
Georgia.....	13,954	" "
Total.....	2,313,216	" "

The make of anthracite pig during the first six months of 1888 was, officially, 886,126 gross tons, so that the total for the year reached 1,784,429 gross tons. The coke pig produced for the first half was 1,885,539 gross tons, so that the total for the year is estimated at 4,198,755 tons, which carries the aggregate of anthracite and coke iron to 5,983,184 gross tons. Add at least 530,000 gross tons for charcoal iron, and we reach the unprecedented total of over 6,500,000 gross tons as the 1888 product of the United States.

The European cables report foreign securities firmer, under the growing belief that the peace of the Continent is secure. Nevertheless, the burden assumed by the several leading powers in warlike preparations is enormous. A London correspondent says: "Every nation in Europe has paid most dearly for the privilege of quiet. Since 1872, when the last elaborate computation of the armies of Europe was made, the tax-payers of the Continent have expended \$7,500,000,000 on preparations for a war that has not come, or nearly twice what we at home expended on our four years of civil war. A big struggle 10 years ago, with results of such a sweeping character that a partial disarmament could have followed, would have been infinitely cheaper and better for Europe than this long nightmare of dread and ruinous preparation. Since 1872 Germany and France have both more than doubled the actual war strength of their armies, and the total war strength of the seven Continental powers, counting the Balkan States as one, has risen from 6,142,000 to 10,480,000. If we add to this host of trained fighters on a war footing the classes of partially trained men in the second and final reserves we get an imposing total of 28,000,000 soldiers, all liable to be drawn into the next European war, and now more or less withdrawn from peaceful vocations, at a total annual public cost of \$600,000,000."

Cotton has long since ceased to be the product of the negro, as remarked by the New Orleans Times-Democrat. When the war ceased nine-tenths of it was raised by the colored race; to-day three-fifths come from white farms. The white States and white districts have become the cotton centers of the South. The negro parishes of Carroll, Tensas and Madison, the finest country in the world, where the yield is greatest and the staple the finest, produce far smaller crops than they bore 30 years ago, while the white counties of Texas have increased their production four and fivefold. This fact attracted the particular attention of Professor Hillgard, who prepared the census report on cotton, and he notes the singular coincidence that the bulk of the crop of Mississippi is raised in the hills, where the yield per acre is small, instead of in the bottoms, where every condition is favorable. The fact did not seem to strike him that the true reason lay in the fact that in the hills the cotton was raised by the whites; in the bottoms by the negroes.

The Blast Furnaces

January 1, 1889.

The year opens with the largest current output in the history of iron making in the United States. Taking the anthracite and coke furnaces together, the returns for the charcoal furnaces not being complete as yet, we are producing at the rate of 142,452 gross tons per week, or over 7,000,000 tons annually, not counting charcoal iron, with an additional 500,000 gross tons. We may state, however, that excepting in the South the reports from different parts of the country show that the climax has been reached. A number of furnaces are ready for work, but will not get in with the present outlook for prices.

On the first of the year the position of the anthracite furnaces was as follows:

Anthracite Furnaces January 1, 1889.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New York.....	24	12	3,828	12	3,442
New Jersey.....	13	5	2,143	8	2,362
Spiegel.....	3	3	264	0	0
Pennsylvania:					
Lehigh Valley.....	44	27	10,036	17	5,413
Spiegel.....	1	1	55	0	0
Schuylkill Valley.....	38	23	7,900	15	3,679
U. Susquehanna Valley.....	17	10	3,069	7	1,606
Lebanon Valley.....	16	14	6,752	2	988
L. Susquehanna Valley.....	22	12	4,679	10	2,266
Total.....	178	107	38,726	71	19,986

For a year past our records show the following:

	Furnaces in blast.	Capacity per week.
January 1, 1889.....	107	38,726
December 1, 1888.....	99	34,879
November 1.....	95	33,645
October 1.....	95	33,728
September 1.....	92	33,541
August 1.....	93	36,397
July 1.....	92	32,478
June 1.....	99	32,418
May 1.....	96	31,006
April 1.....	94	30,496
March 1.....	98	28,598
February 1.....	97	29,969
January 1.....	118	38,206
December 1, 1887.....	122	39,487
November 1.....	124	40,028
October 1.....	123	39,440
September 1.....	125	38,338
August 1.....	129	37,990
July 1.....	138	40,742

It will be observed that there has again been a notable increase in the number and in the capacity of anthracite furnaces in blast. In New York, Charlotte and the second Port Henry are producing, the latter having gone into blast on the 13th of December. In New Jersey, Andover has added heavily to the product of the State, its good record having been alluded to in a recent issue of The Iron Age. In the Lehigh Valley the Allentown Iron Works are running two furnaces; Glendon added the second stack during December, but, on the other hand, Bethlehem reduced the number of its plant in operation by one furnace, leaving only four running. The Thomas Iron Company put out its No. 6 Hokendauqua furnace for repairs, the probability being that it will not be again blown during this winter, as No. 5 was started very successfully to take its place. No. 7 is out for repairs, but it is not likely that it will resume during the next few months. In the Schuylkill Valley, Chester, which we group with this district, produced nearly the whole of the month; Marion went in on the 10th; Montgomery ran the greater part of the month, but, on the other hand, Norristown blew out. Warwick closed the year with the largest six months' product ever attained by that

phenomenal furnace. No changes have taken place in the Upper Susquehanna Valley. Among the furnaces which we group under the Lebanon Valley it may be noticed that the Lebanon Valley resumed on the 20th of last month, and that the second Bird [Coleman, which is now out for repairs, will blow in on or about February 1. There are few districts in the country where the furnaces are more constantly employed in good or bad times than those of this favored region. Robeson closed the year with an excellent record, considering the fact that in an 18 x 20 furnace it is using exclusively Cornwall ore, which fluctuates from 8 to 43 per cent. in silica. In the Lower Susquehanna Valley no changes of any consequence have taken place. A number of our correspondents report to us that their furnaces are ready for work, but that under the existing market conditions they see no encouragement what ever in resuming the manufacture of iron.

The coke furnaces opened the year with the following status:

Coke Furnaces January 1, 1889.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New York.....	3	1	1,118	2	2,000
Pennsylvania:					
Pittsburgh district.....	19	19	20,000	0	0
Spiegel.....	1	1	420	0	0
Shenango Valley.....	19	16	11,270	3	1,740
Junata and Conemaugh Valley.....	18	11	5,691	7	2,490
Spiegel.....	1	0	0	1	430
Youghl. Valley.....	5	4	1,605	1	600
Miscellaneous.....	4	4	2,080	0	0
Maryland.....	2	1	250	1	120
West Virginia.....	6	3	2,440	3	538
Ohio:					
Mahoning Valley.....	14	11	9,380	3	2,374
Central and Northern.....	18	11	7,958	7	4,448
Hocking Valley.....	14	8	2,899	6	1,340
Hanging Rock.....	13	7	1,730	6	1,045
Indiana.....	2	2	388	0	0
Illinois.....	12	10	11,485	2	1,525
Spiegel.....	1	1	725	0	0
Wisconsin.....	4	3	1,680	1	700
Missouri.....	6	1	568	5	2,120
Colorado.....	1	1	490	0	0
The South:					
Virginia.....	11	8	3,887	3	2,117
Kentucky.....	4	4	1,320	0	0
Alabama.....	21	18	10,360	3	1,300
Tennessee.....	11	11	5,262	0	0
Georgia.....	2	1	501	1	200
Total.....	211	157	108,726	55	25,827

As compared with previous months, these figures stand as follows:

	No. of furnaces.	Capacity per week.
January 1, 1889.....	157	108,726
December 1.....	151	101,748
November 1, 1888.....	146	94,685
October 1.....	137	85,461
September 1.....	133	81,082
August 1.....	122	74,855
July 1.....	121	69,543
June 1.....	128	75,427
May 1.....	120	75,815
April 1.....	128	70,644
March 1.....	128	68,662
February 1.....	136	73,912
January 1.....	143	83,101
December 1, 1887.....	144	88,435
November 1.....	151	90,459
October 1.....	152	89,123

In the Shenango Valley both Stewart furnaces are now at work, leaving only three in the entire district out of blast. Rosena has, during the past month, eclipsed its former record, rising to the position of one of the heaviest producers in the valley. There is nothing of special interest to report among the other Pennsylvania furnaces. In West Virginia, Irondale is out of blast, to resume on February 1. In the Mahoning Valley, Hannah stopped work on December 7.

Grace is still out, but otherwise the product of the district continues heavy. Among the furnaces grouped under Central and Northern Ohio we may note that the lining of one of the Cherry Valley furnaces fell in lately, causing a blow-out. Steubenville stopped work during Decem-

ber in order to make repairs. In the Hocking Valley production is heavier now than it has been for some time past. One of the new Floodwood furnaces is doing good work, its product being about 120 tons a day. In the Hanging Rock region no changes of any consequence have taken place. In Illinois one of the Chicago furnaces has blown in on spiegel, while in Wisconsin Mayville lost a week during the month by being banked. In Missouri one of the Missouri furnaces is still the only one at work, but the St. Louis Ore and Steel Company will start one of theirs about the 20th of this month. In the South there have been no changes of any consequence. The second DeBardeleben, No. 2 Sheffield and Birmingham, and the Trussville furnaces are expected to go into operation at an early date. The first named is waiting for the completion of additional boiler plant and the fifth engine. In Tennessee every one of the furnaces entered the year in full operation.

Washington News.

(From Our Regular Correspondent.)

WASHINGTON, D. C., January 8, 1889.

On next Monday week under the order of the Senate a vote should be taken on the substitute for the House tariff bill. The managers of the Senate measure are pushing their labors with the utmost possible expedition, and are still confident of taking a vote on the day fixed, although they are experiencing considerable opposition from some of their own members. Every point of objection and disagreement among the Republicans has been removed, except on the sugar provisions. The sugar Senators, like Stanford, Plumb and Cullom, are opposed to the 50 per cent. cut of the duty and substitute in part of bounty to producers, but will agree to 25 per cent. reduction pure and simple. They claim that while the theory of a bounty was proposed as early as in the report of Secretary Hamilton, it was suggested as a stimulus to certain home manufactures or productions as against foreign competition, but not for the purpose of cutting down duties at one end and putting on bounties at the other. Hamilton himself, in mentioning the subject of bounties as one of the methods of fostering industries, spoke of its convenience to fraud. The Western Senators, as a rule, oppose the bounty system as contrary to the prevailing views of the people of their section on the tariff legislation. In their arguments before the Committee on Finance, they pointed out the important fact that tariff revision in the West meant adjustment of duties to the actual necessities of protection of home industries and labor, and not to foster monopoly or unnecessarily sustain taxation.

The committee and the opponents of the sugar scheme of the Senate substitute have not yet come to an understanding. It is not improbable, however, that they will patch up some sort of a modification before they get through. Senator Aldrich said to-day: "The 21st of the present month is the time fixed for a vote, and we will take a vote on that day, but what kind of a vote we cannot say. It would be impossible just now to tell how the matter will end, as there are still disputed points undisposed of. We are confident, however, of reconciling everything and coming forward with united front when the bill is put upon its passage."

The metal schedule will go through without a change except in the amendments favored by the committee, as the increase of the tin plate duty from 1 to 2½ cents a pound and other points favorable

to the metallurgical industries. The Republican managers are specially anxious to get the bill over to the House in order to give the Committee on Ways and Means an opportunity to take a definite position on the subject for political purposes. The committee are ready to take it up at any time, but it is more doubtful than ever whether they will venture to permit a vote to be taken.

There is now little doubt as to an extra session. During the recent visit of Senator Hiscock to Indianapolis to submit the agreement of the big four as to the placing of Warner Miller and Thomas C. Platt officially, the President elect took advantage of his presence to ask a number of questions as to the outlook for the passage of a tariff bill. The Senator's prominence as a member of the sub-committee charged with the preparation of the Senate substitute and his familiarity with the subject enabled him to explain the situation very satisfactorily. The President expressed his desire to have something done not only to relieve the surplus, but to adjust duties to the conditions of trade and the needs of industry. The President elect also mentioned the necessity of disposing of the question without unnecessary delay, and seemed to intimate that unless some concurrent action were reached before the close of the present Congress it should be taken up promptly by an extra session of the next. General Harrison, in the matter of an extra session, has intimated to several Senators that he will defer largely to the views of Senators and Representatives. The candidates for the Speakership are generally in favor of an extra session, as they wish to close up the contest by bringing it to a speedy battle for the presiding office of the popular branch of Congress. The Eastern candidate, Reed, still holds the field for his section. The attempt to cause a diversion against Reed in the East by putting up Cabot Lodge, of Massachusetts, who was at once opposed by his own delegation, and Tom Bayne, of Pennsylvania, who said the use of his name was unauthorized, and that he was not and would not be a candidate, has failed. It has leaked out, however, that Mr. Reed cannot hold his Eastern strength after the first ballot in caucus, owing to an opposition from Maine through the friends of Mr. Blaine.

In the West the strength will be divided among McKinley, of Ohio; Cannon, of Illinois; Henderson, of Iowa, and Burrows, of Michigan. Developments within the past few days indicate a very decided change in the situation. The first indications were that Cannon would lead off in the number of votes, with McKinley, Henderson and Burrows following. But latterly certain contingent arrangements have been made which put Burrows in an excellent position to carry off the prize. The Eastern men when they break from Reed will go for him, and the Southern Republican vote, which will doubtless decide the day, is strongly for Burrows as matters now stand.

The election of Burrows would make the four rival candidates chairmen of the leading committees, according to their strength. Cannon at the head of Appropriations, Reed or McKinley at the head of Ways and Means, and the one left at the head of Elections, and Henderson in the chairmanship of Military Affairs. From all present indications, the Fifty-first Congress will be in session within six weeks and will remain so until July or August, on the tariff question and admission of the new States.

The activity of the candidates for the Speakership indicates what they think of the outlook. They are working over the field very effectually and bringing to their aid all the outside senatorial and political assistance they can muster.

Judging from a conversation with Mr. Blaine, that gentleman will take a quiet but active interest in the Speakership, and his friends are rallying about him to a degree which indicates that his residence in Washington will not be without its influence and significance, whether he take the premiership or not.

The Scottish Pig Iron Industry.

A writer in the *Iron and Steel Trades Journal* reviews the condition and progress in the Scotch iron trade in an interesting manner. Without attempting to vouch for the accuracy of the data given, we submit below the greater part of this communication:

Fifteen to twenty years ago Great Britain supplied over one-half of the pig iron consumed in the world, and of that large proportion Scotland produced the lion's share. Middlesboro' and the West Coast were then in their infancy. America 20 years ago produced about 1,500,000 tons, now she produces 7,000,000; Germany produced 1,000,000, now she produces 3,500,000; and the other countries have all greatly increased their output. This enormous increase finds its way into consumption, and therefore Britain could not now meet one-half of the demand of the world. In Scotland the consumption has increased to a greater extent than the production, and we find that now, if she consumed only her own production, she would have almost no pig iron to spare for export—not more than 100,000 tons. And while other countries in developing their iron resources have adopted their most economical methods, the Scottish ironmasters have not been standing still. In Middlesboro', with great beds of ironstone near their furnaces, it is supposed, indeed generally acknowledged, that in normal times iron can be produced in that district so as to supply consumers under 31/ to 33/6 per ton and leave a reasonable manufacturing profit. These figures may be slightly affected by the gradual consumption of the ores nearest the furnaces, entailing a heavier transit on the rest; also by the importation of large quantities of Bilbao ore; but they need not be materially altered. In examining how Scotland compares with these figures, it will be useful and instructive to examine the improvements and changes made during the last 15 or 20 years in her methods of production. While these changes may not, in all cases, have improved the quality of the products, they have certainly reduced the cost of manufacture. The first improvement consisted in raising the height of the blast furnaces from 45 or 50 to 60 or 80 feet, and resulted in a reduction of the consumption of coal to the extent of 5 to 12 cwt. per ton of iron made, thus reducing the cost from 1/3 to 3/ per ton of pig iron. The second improvement consisted in covering over the top of the blast furnaces, taking off the gases, and utilizing them for raising steam and heating the air to be used in the blast furnace.

The following advantages have accrued from this change: 1, the small coal formerly used for these purposes, amounting to from 7 to 14 cwt. per ton of pig iron made, is not now required; 2, the expense of firing is saved; 3, the air being more uniformly heated by the gas, the tear and wear of the heater pipes is not so great as formerly; and, 4, which is the greatest advantage, the air is more highly heated, as well as maintained at a more uniform temperature, thereby producing more iron and with a less consumption of coal. The saving under these heads will be from 2/ to 3/6 per ton of iron with coal and slack at their present values. At several works in Scotland the improved fire-brick stoves for heating the air have

displaced the ordinary pipe heater, and the result has been a further saving of 8 to 4 cwt. of coal per ton of iron. The third change—and here our remarks are not of general application—consists in putting into the furnace from 30 to 40 per cent. of cinder (tap and mill) from the malleable iron works, using this material to that extent in place of calcined ironstone or iron ore. This has reduced the cost of the pig iron to the extent of from 5/ to 6/ per ton.

The fourth improvement, which is perhaps the one of greatest interest, consists in depriving the gases before they are used for raising steam, &c., of their tar and ammonia. The result of this has been to secure tar and ammonia to the value of over 3/ per ton of coal put into the blast furnace, less about 1/ per ton for plant and expenses (see *Journal of Gas Lighting* of February 5, 1884). As somewhere about 2 tons of coal are used in the manufacture of 1 ton of pig iron, the saving thus effected will be about 5/ per ton. The gases after being so treated are said to be quite as useful for raising steam and heat as before.

The fifth improvement is the manufacture of coke from slack coal, obtaining from it in the process oil or tar and ammonia. In England these processes are now being successfully conducted, and the profit resulting is said to be very considerable. In one of the Ayrshire iron works a large plant to make coke and to secure the tar and ammonia has just been started. In one iron works in Scotland coke from gas works was lately used in the blast furnace, and is said to give fair results, the cost of producing iron being further considerably reduced. It is to be noted that the average make of the blast furnaces in Scotland has been increased 1500 tons per furnace per annum over the last 20 years. Another important change to note is the large quantity of Spanish ore now imported, at prices that 20 years ago would not have been thought possible.

It is suggested, in order to cheapen the process of iron making, that the ironmaster should sell or use for other purposes the large quantity of gas not required and allowed to go to waste. So far, then, as the cost of Scottish pig iron is concerned—i. e., pig iron made where no cinder is used—it is clear that in the working of the blast furnace alone a saving is being effected of about 10/ to 13/ per ton as compared with what could be done 20 years ago, and that a much larger saving is effected when iron is made from a mixture of iron ores and malleable iron works cinder. If our Scottish ironmasters but persevere on the lines they now are on they should be able to make pig iron much more cheaply than they are even now doing, and so produce a pig like Middlesboro' at a cost not much in excess of the cost of Middlesboro' f. o. b. Tees, and thus enable the Scottish masters to put their iron into consumption instead of into the public stores. In these remarks we have adopted as a basis the figures which prevailed for some time before the present unsettled state of labor increased the cost of production, but as this element exists in both the North of England and Scottish markets, the comparison itself remains unaffected.

Fifteen to twenty years ago 48/ to 50/ was considered a fair and safe price for Scottish G. M. B. warrants. Taking the above improvements into account, these figures represent now 36/ to 39/, less 3/ for the difference of storing expenses and the proportion of No. 1 iron necessary for warrant making, which gives foundry iron at 33/ to 36/, prices under which Middlesboro' foundry irons cannot at the present time be supplied to consumers here, taking into account the transit from Middlesboro' of 4/8 to 7/ per ton, according to the position of the Scottish works.

The question naturally arises, if the above be correct, How is it that the Scottish G. M. B. does not go more into consumption? To this there are three replies. First, consumers tempted by the formerly cheaper price of Middlesboro', had got into the habit of using it, and in many cases preferring it, while their foremen and workmen have become accustomed to the properties of the Middlesboro' iron; they are, therefore, naturally indisposed to change again to Scottish until they see a probability of a permanent supply at equal or more advantageous prices than Middlesboro' iron. Second, the iron is now going more into consumption here, and many consumers have recently begun to use Scottish instead of Middlesboro' iron, but the chief cause is that the Scottish G. M. B. iron, when put into store, is transferred into mere speculative counters, and the price is forced up or down, according to the "transactions of operators," without regard to the demands of trade, and without the slightest regard to its intrinsic value as an article of consumption. So long as the speculative public are prepared for merely speculative purposes to pay a price so much above its value as an article of consumption, so long will our G. M. B. iron be put into store, and the iron of other districts be put into consumption.

Naturally (unless some iron famine comes, which, with the present colossal power of production the world over, seems almost impossible) this will have an end some time. The speculative public, though large, is not unlimited, and its purse is not exhaustless. At the moment it requires, in one shape or another, over £2,000,000 to finance the stock of warrants. With interest, storage and other expenses, the speculative public pay £150,000 yearly, and, as the stocks go on daily increasing, the burden becomes daily greater. It is clear that until Scottish iron does go into consumption to the extent of its make the trade is not only in a false position, but the longer this is delayed the more serious will be the consequences. Banks and financing houses advance within a few shillings of the market price, and so assist in perpetuating the evil, but when the last feather is laid upon the camel's back, and the intrinsic value as an article of consumption has to be taken as the standard of its worth, instead of the purely speculative value, operators, banks and financiers may make some unpleasant experiences.

Practical Electricity, a Boston journal, says that files can be recut by cleaning them and placing them in acidulated water between two plates of carbon and closing the circuit so as to form a real voltaic cell. The hydrogen liberated clings to the points of the teeth of the file, protecting them from further action, but the cutting action proceeds freely over the remainder of the file. This process speedily brings back the teeth of an old file to the original shape and dimensions and does not merely sharpen them but practically recuts the file, without necessitating either softening or retempering the metal.

The work of lighting Hoosac tunnel has been completed, after a year's labor, 40 miles of lead-covered cables have been laid in wooden conduits in trenches on each side of the tracks. The power is supplied from two 125 horse-power boilers and a 125 horse-power engine, three dynamos each of 650 16-candle-light capacity, and two direct current machines.

The Pennsylvania Railway system is said to have added 13,000 cars to its rolling stock equipment this year, and yet has an insufficiency for its traffic.

TRADE REPORT.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St.,
PHILADELPHIA, Pa., January 8, 1889.

There is not much business to report so far in the new year, although matters appear to be developing favorably and the feeling is generally of a hopeful character. Some disappointment is felt at the tardiness in placing orders by many large consumers, but this is in some measure due to the uncertainty in prices. The feeling is unsettled and in some instances rather weak, although there is no quotable change in prices. A few low-priced lots have been taken off the market, so that the pressure to realize is not unusual, notwithstanding the fact that everybody stands ready to accept business at quoted rates. The impression is that things will get into shape by the end of the month, and that further weakness can only be of short duration. The amount of goods turned out in this great manufacturing city during 1888 is believed to be the largest in its history. The Baldwin locomotive Works turned out 737 locomotives during the year, 272 Consolidations, 275 Moguls and 10-wheelers, and 190 American and miscellaneous. They are still running full time, and have a large amount of work on hand for spring and summer delivery, besides a considerable amount of foreign work. Prospects are said to be very favorable, as they are receiving inquiries from roads that are likely to be large buyers in the near future. Prices are low, however, and as in other branches margins are said to be very close.

Pig Iron.—The market remains in a very dull and apathetic condition, with occasional offerings at prices somewhat less than ordinary quotations. But it cannot be said that there is any general weakness, as desirable brands command the old figures, say \$16 for Gray Forge, \$17.50 for No. 2 Foundry, and \$18.50 @ \$19 for No. 1, tidewater deliveries. The demand is not large, but up to this time has been sufficient to prevent inconvenient accumulations, or the necessity for lower figures. The future remains somewhat uncertain, although many of the leading concerns profess full confidence in the ultimate outcome. It is claimed that with the resumption of work, now becoming general, there must be an increasing demand for Pig metal, and that at the longest, two or three weeks more will bring a great deal of business into the market, and that with demand in proportion to consumption prices will soon resume a stronger tone. Comparatively little Iron has been used within the past two or three weeks, and as prices have not been greatly affected by the suspension of work, it is not unreasonable to expect that they will at least remain steady, now that resumption is beginning. This is the theory, at all events, and there is nothing definite in sight to lead to a contrary opinion. There is, of course, an accumulation of stocks at some of the furnaces, and there is a very large productive capacity in operation, and it may prove to be in excess of consumptive requirements; in which case prices must suffer eventually, but the chances are at least equal, if not slightly in favor of the more hopeful theory. Much will depend on the outcome of events during the next 30 to 60 days, which at the moment appear to be developing very favorably. Several important undertakings are in process of negotiation, which, if carried out, will throw a great deal of business into the market at once. Some of these are said to be virtually decided upon, so that it should cause no surprise

to see heavy buying almost immediately. As regards actual purchases of Pig Iron, we cannot find that any large orders have been placed so far, excepting some 10,000 tons of Southern Iron to Pipe foundries at about \$15, ex-ship, Philadelphia. As a matter of fact, all classes of buyers are moving slowly, taking small lots at current rates until they can see a little further ahead. Large orders could be had by sacrificing 50¢ to \$1 ½ ton, but for the present sellers—for the same reasons as buyers—prefer to keep things moving at current quotations, waiting for more light before deciding on their course.

Foreign Iron.—There is some little inquiry, but prices bid are so far from asking rates that there is but little probability of business being closed. Bessemer is nominally \$20, c.i.f. duty paid, and 20 % Spiegeleisen, \$27.

Blooms.—A fair demand for Steel, but prices are irregular, and for large lots probably somewhat easier. Ordinary quotations about as follows: Steel Nail Slabs, \$28.50 @ \$29, at mill; Billets, from \$32 to \$36, according to analysis; Charcoal Blooms, \$52 @ \$54; Run-out Anthracite, \$42 @ \$44; Scrap Blooms, \$32.50 @ \$34 ½ "bloom" ton of 2464 lb.

Muck Bars.—There is very little business to report, although there are free sellers at from \$28.50 to \$29, at mill. Buyers show no interest in the market at present.

Bar Iron.—Business has been very dull during the past four or five weeks, although prices have been fairly maintained in the majority of cases. Some of the mills that were in need of orders to start the new year with quoted as low as 1.75¢ for a good quality of Iron, but with prospects of a larger business, due to more inquiry from the best class of buyers, prices are a little firmer, 1.8¢ being an inside quotation, with 1.85¢ to 1.9¢ asked by those supposed to make a superior quality of Iron. The outlook is improving and there is a better feeling all around, based, as stated, on a better inquiry from large buyers. Skelp is dull and easier at from 1.82½¢ to 1.85¢ asked. Sales some days ago were made at 1.80¢ for 1000 tons of Grooved, which would likely be accepted again for a desirable order.

Plate and Tank Iron.—There is no improvement to report in this branch of the Iron trade. Some of the mills are quite busy, others are looking for orders, which at present are not to be found in quantity. Prices are weak, due very largely to the continuous competition from the West, particularly in Steel Plates. Quotations are nominally as quoted during December, but good-sized orders if offered would be taken at concessions of half a tenth, perhaps a tenth, if quantity, delivery, &c., made the order a desirable one. Asking prices as follows: 2¢ @ 2.1¢ for Ordinary Plates and Tank plates, 2.1¢ @ 2.2¢ for Universal Plates; Shell, 2.4¢ @ 2.5¢; Flange, 3.5¢; Fire-Box, 4¢; Steel Plates, Tank and Ship Plate, 2.25¢ @ 2.3¢; Shell, 2.7¢; Flange, 3¢ @ 3½¢; Fire-Box, 3½¢ @ 4½¢.

Structural Iron.—There is more inquiry for shapes, and prospects are said to be improving, especially for bridge work. A few fair-sized orders have been placed, but nothing important as yet. Beam manufacturers have reduced prices to 2.8¢ for Eastern deliveries as against 3.3¢, which has been the quotation for a long time. The encroachments made by the Steel companies have been so great that it was thought desirable to make ¼¢ lb reduction, and, in addition to that, there is a desire to start in on a low basis of prices, so as to give the building trade every possible encouragement for spring operations. Quotations are about as follows: Bridge Plate, 2¢ @ 2.1¢; Angles, 2¢ to 2.1¢; Tees, 2.4¢ to 2.6¢; Beams and Channels, 2.8¢ for Iron or Steel.

Sheet Iron.—Business is very dull at present, and only small lots are called for. On large orders special quotations would be made, but for small lots prices of best makes are as follows:

Best Refined, Nos. 26, 27 and 28.....	3½¢ @ 3½¢
Best Refined, Nos. 18 to 25.....	3 @ 3½¢
Common, ¼¢ less than the above.	
Best Bloom Sheets, Nos. 26 to 28.....	4½¢ @ 4½¢
Best Bloom Sheets, Nos. 22 to 25.....	4 @ 4½¢
Best Bloom Sheets, Nos. 16 to 21.....	3½¢ @ 3½¢
Blue Annealed.....	2.8 @ 3
Best Bloom, Galvanized, discount.....	.62½¢
Common discount.....	.67½¢

Merchant Steel.—Orders have come in quite freely, and in some instances a decided increase of business is noted. Prices are unchanged—viz.: Tool Steel, 8½¢; Machinery, 2.6¢; Crucible Spring, 4½¢; Crucible Machinery, 5¢; Best Sheet Steel, 10¢; Ordinary Sheet, 8¢.

Steel Rails.—The demand is still very slow, and inquiries from large buyers are not coming in at present. Prices are steady, however, \$28 at mill being a firm quotation. Sales are reported at about that figure, but only small lots are called for.

Old Rails.—There are sellers of T's for shipment at \$23.75 @ \$24, but buyers are not bidding over \$23, although spot lots would probably command 50¢ to 75¢ more. Sales at \$24.50, delivered at mills in the interior, with a fair demand at from \$24 to \$24.50.

Scrap Iron.—There is a fair movement in the interior, but not much doing in seaboard lots. Cargoes for shipment are offered at \$20.75 @ \$21, with buyers at \$20 @ \$20.50. General quotations are about as follows: \$21.50 @ \$22 for carload lots, delivered, or for choice \$22.50; No. 2 do., \$14 @ \$15; Turnings, \$13 @ \$14; Old Steel Rails, \$20 @ \$21; Cast Scrap, \$15 @ \$16; do. Borings, \$9 @ \$10; Old Fish Plates, \$25 @ \$26; Old Car-Wheels, \$17 @ \$18, Philadelphia, or its equivalent.

Wrought Iron Pipe.—There is more inquiry, and business is looking rather more hopeful. A good deal of cutting has been done during the past two or three weeks, but efforts are now made to maintain discounts, which are nominally as follows: Black Butt-Welded, 52½ ¢; Galvanized do., 42½ ¢; Black Lap-Welded, 62½ ¢; Galvanized do., 52½ ¢; Boiler Tubes, 60 ¢.

Nails.—There is no improvement to note in this department, and prices are very irregular, although standard brands are held at \$1.90 @ \$2. Outside lots are quoted at low prices for carload lots, but quality cannot be considered satisfactory.

Chicago.

Office of *The Iron Age*, 95 and 97 Washington street, CHICAGO, January 7, 1889.

Nothing has occurred in this market during the past week worthy of special mention or having sufficient significance to determine what the course of prices is likely to be for any length of time. An exception might be made in the case of Scrap Iron, as No. 1 Wrought has been offered at \$19.50 without takers, and a 50 ton lot is understood to have been sold at about \$18.50 by one city dealer to another; but these low prices may possibly indicate only the extreme dullness now prevailing, and not such a decided decline in the value of material as is here apparent. In Pig Iron and Old Rails transactions have been very limited. Bar Iron is in better demand than almost anything else in the list, and sellers are looking forward to a very good month's business for January at old prices. Plates are quiet, and dealers are making concessions to induce purchases. Nails and Barb Wire are without change. The wholesale Hard-

ware trade is quiet, most houses having their travelers at home receiving instructions for the new campaign about to be opened.

Louisville.

LOUISVILLE, KY., January 7, 1889.

Pig Iron.—The tendency of the market has been downward, and sales have been made at prices that we did not believe possible a short time ago. The trouble does not lay so much among buyers as among the representatives of outside furnaces. The present prices were not asked nor expected, but were brought about by one furnace's representative shading the market, followed by others, until the buyer became demoralized and did not know what to expect. At present the market has got into such a rut that many think it would be best for the bottom to be knocked clear out, so the reaction could come as soon as possible. There has been considerable selling during the week, and an active demand has sprung up, which will result in the placing of orders for long delivery if furnaces are willing to meet the views of buyers in this respect. We quote as follows:

Southern Coke, No. 1 Foundry, new classification.....	\$15.50 @ \$16.00
Southern Coke, No. 2 Foundry, new classification.....	15.00 @ 15.50
Southern Coke, No. 3 Foundry, new classification.....	14.50 @ 15.00
Gray Forge.....	14.00 @ 14.50
White and Mottled, different grades.....	13.50 @ 14.00
Silver Gray, different grades.....	13.75 @ 14.50
Southern Charcoal, No. 1 Foundry.....	16.50 @ 17.00
" " No. 1 Mill.....	15.25 @ 15.75
Southern Car-Wheel, standard brands.....	22.50 @ 23.50
Southern Car-Wheel, other brands.....	18.50 @ 20.00
Hanging Rock Coke, No. 1 Foundry.....	16.00 @ 16.50
Hanging Rock Charcoal, No. 1 Foundry.....	20.00 @ 21.50
Hanging Rock, Cold Blast.....	21.25 @ 22.25

Cleveland.

CLEVELAND, January 7, 1889.

Iron Ore.—Buyers and sellers are not very far apart regarding prices for Ore for 1889. It is confidently believed that actual sales will occur by the middle of the month. Certain furnacemen have asked the mine owners for prices on big blocks of Bessemer Ores, and asking prices will be established immediately after the yearly meetings of the score or more of mining companies. The existing low quotations for Rails account for the prognostications made in certain quarters that Ore quotations for 1889 will fall below those of the past year. To this assertion is now added the claim that the furnaces are stocked with Ore sufficient in amount to carry them along until the middle of the year. Lake freights will certainly be no higher than last year, and from present indications will fall from 5 to 10 % below. Considering all features of the situation, it is believed that Ore prices will not vary more than 15¢ or 20¢ per ton from those of last year. About 25,000 tons of Ore were shipped to the furnaces during the past week, and the amount of unsold Ore on the docks at all Lake Erie ports has been cut down to about 82,000 tons, as against 600,000 tons at a corresponding period last year.

Pig Iron.—The demand shows little improvement and is probably not quite as active as it was last week. Special grades of Iron have sold with considerable freedom, but standard Irons are dull. Lake Superior Charcoal Iron seems an exception to the general rule, and negotiations for fairly large orders of this grade are reported. Prices remain practically unchanged on account of the absence of stock piles. Furnacemen are careful about granting concessions for fear of affecting the tone of the whole market, which is reasonably sure to improve before Feb-

ruary. The following are cash quotations:

Nos. 1 to 6 Lake Superior Charcoal.....	\$20.50 @ \$21.50
No. 1 Strong Foundry, Bessemer quality, per ton.....	18.20 @ 19.00
No. 1 Strong Foundry, per ton.....	18.00 @ 18.50
No. 2 Strong Foundry, per ton.....	17.00 @ 17.50
No. 1 American Scotch, per ton.....	18.25 @ 18.70
No. 2 American Scotch, per ton.....	17.20 @ 17.70
No. 1 Soft Silvery, per ton.....	18.50 @ 19.00
Mahoning and Shenango Valley Neutral Mill Irons, per ton.....	16.00 @ 16.50
Mahoning and Shenango Valley Red Short Mills, per ton.....	17.00 @ 17.50

Scrap Iron.—Car-Wheels have sold freely during the week, but Rails are still in scant demand, the price for Old Americans remaining at \$24 @ \$24.50, with a few scattering sales at the latter figure.

Manufactured Iron.—The sale of 2000 tons of Bar Iron is reported to have occurred during the first week in January, the consideration being 1.65¢. The demand at present, however, is weak, and there are few sales, even at 1.60¢. Sheets and Plates are also weak.

Cincinnati.

Office of *The Iron Age*, Fourth and Main Sts. CINCINNATI, January 7, 1889.

Pig Iron.—A weak tone has prevailed during the week for Pig Iron, and lower prices have been accepted. The period of prosperity enjoyed by the furnaces for a brief time has stimulated the old plants long idle and also multiplied new stacks in the South, until now the output of Pig is too great to be readily absorbed by the consumptive trade, although the wants of the country have increased materially during the past few months. Evidence of supplies beyond immediate wants, however, has given buyers courage to hold out for lower prices, and, with increased pressure to sell, the apparent overproduction is increased beyond the actual facts. There is but little doubt that purchases made within a short time, but for long delivery, will prove profitable to buyers; but, for the time being, the market is weak, if not demoralized, and buyers are naturally induced to make only such purchases as they may require for current wants. The result is that but few large transactions have been made during the week, the largest reported being for 2000 tons No. 2 Foundry Iron, and even that has been in course of consumption over a week. The following are the approximate prices current here at the close for cash, f. o. b.:

Foundry.	
Southern Coke, No. 1 (new classification).....	\$15.75 @ \$16.25
Southern Coke, No. 2 (new classification).....	15.00 @ 15.50
Southern Coke, No. 3 (new classification).....	14.25 @ 14.75
Ohio Soft Stone Coal, No. 1.....	16.50 @ 17.00
Ohio Soft Stone Coal, No. 2.....	15.50 @ 16.00
Mahoning and Shenango Valley.....	17.00 @ 18.00
Hanging Rock Charcoal, No. 1.....	21.00 @ 22.00
Hanging Rock Charcoal, No. 2.....	19.00 @ 22.00
Tennessee and Alabama Charcoal, No. 1.....	18.00 @ 18.50
Tennessee and Alabama Charcoal, No. 2.....	17.00 @ 18.00
Forge.	
Strong Neutral Coke.....	14.00 @ 14.25
Mottled Neutral Coke.....	13.00 @ 13.25
Gray Forge.....	13.25 @ 13.75

Car-Wheel and Malleable Irons.	
Southern Car-Wheel.....	20.00 @ 25.00
Hanging Rock, Cold Blast.....	22.00 @ 25.00
Lake Superior Car-Wheel and Malleable.....	21.00 @ 22.00

Manufactured Iron.—An easier tone has prevailed, in sympathy with Pig Iron, and some mills are reported to have cut rates, but the majority adhere to old quotations, with a moderate volume of business.

Old Material.—The market has been without animation and easier in tone; the offerings have increased some, but there has been no marked pressure to sell. Old Rails are quotable at \$22.50 per ton, and Old Wheels are saleable at \$19.50, spot cash.

Nails.—The demand has not increased, and an easy time has prevailed; 12 @ 40d sell at \$1.90 @ \$1.95 per keg, with 10¢ rebate in carload lots at the mills; 50 @ 60d 25¢, 10d 10¢, 8 @ 9d 25¢, 6 @ 7d 40¢, 8d \$1, and 2d \$1.50 per keg more. Steel Nails sell at \$1.90 @ \$1.95, and Steel Wire Nails at \$2.60 @ \$2.65 per keg.

Pittsburgh.

Office of *The Iron Age*, 77 Fourth Ave., PITTSBURGH, January 8, 1889.

The outlook for the new year is generally regarded with favor. It is generally believed that 1889, so far as it relates to the great interests represented by *The Iron Age*, will be fully equal to that of 1888, and in some respects there is reason to believe it will show an improvement.

The decision of the Supreme Court of the State in regard to the Allegheny Heating Company vs. Allegheny City, is regarded as a victory for the natural gas companies, deciding as it does that the courts cannot interfere in regard to the charges for natural gas, that that is a matter which must be adjudicated between the parties in interest. In other words, if the gas consumer is dissatisfied with the price demanded by the gas company his remedy is to go back to coal, which but very few of them care to do, and the gas companies are aware of this. The Philadelphia Gas Company recently issued a circular to large consumers to economize in the use of the gas, intimating that a very large percentage was wasted. Jones & Laughlins are putting down a gas line of their own, and it is probable that other large consumers will do likewise.

Pig Iron.—Market dull, but there will no doubt be an improvement before the close of the present year. The recent break, which was generally unlooked for, has unsettled the market; buyers are disposed to hold off in anticipation of a further decline, while furnacemen are refusing to make any further concessions. Furnacemen can see no way by which cost of production can be reduced. There is but comparatively little Iron offering here by furnaces at a distance. We quote prices as follows:

Neutral Gray Forge.....	\$15.25 @ \$15.50, cash.
White and Mottled.....	14.50 @ 15.00, "
All Ore Mill.....	16.00 @ 16.25, "
No. 1 Foundry.....	17.50 @ 17.75, "
No. 2 Foundry.....	16.75 @ 17.00, "
No. 2 Charcoal Foundry.....	21.50 @ 22.00, "
Cold Blast Charcoal.....	25.00 @ 26.00, "
Bessemer Iron.....	17.00 @ .., "

Good brands of Gray Forge are offering freely at \$15.50, cash, although some furnacemen are refusing to sell at that price. So far as we can learn there have been no sales of standard brands of Bessemer below \$17, cash, at which price it is freely offered.

Muck Bar.—Continues very dull, and prices are weak, in sympathy with Pig iron; it is offering freely at \$28.50, cash, and it is rumored that sales have been made as low as \$28, cash. One mill, running almost entirely on Muck, has shut down for the time.

Spiegel Eisen.—Spiegel 20 % is still quoted at \$28 @ \$28.50. Sales 150 tons Ferromanganese 80 % at \$54.50 @ \$55.

Manufactured Iron.—The demand for all kinds of Merchant Iron continues light, but it is expected that there will be an improvement before the close of the present month. Prices are still quoted on a basis of \$1.75 @ \$1.80 for Bars, 60 days, 2 % off for cash. Skelp Iron is quoted at \$1.70 @ \$1.75 for Grooved and \$1.90 @ \$1.95 for Sheared.

Nails.—There is no improvement to note in the Nail trade here. Pittsburgh manufacturers still refuse to sell below \$1.90 for 12d to 40d, 60 days, 2 % off for cash, while in the Wheeling district the card is 10¢ per keg less, or \$1.80, 60 days, 2 % off. Some of the factories in the

Wheeling district have large contracts for future delivery, but the Pittsburgh factories are doing nothing, or next to it.

Wrought-Iron Pipe.—The Wrought-Iron Pipe trade continues devoid of animation, although all, possibly, that can be expected at this time and under existing circumstances; prices continue irregular; it is difficult to give reliable quotations, as it is an open market. Discounts may be given as follows: On Black Butt-Welded Pipe, 52½ and 5%; On Galvanized do., 45 and 5%; on Black Lap-Welded, 62½ and 5%; on Galvanized do., 52½ and 5%; 2-inch Tubing, 13¢ per foot, net; 5½-inch Casing, 37½¢.

Old Rails.—There is less inquiry, and the market is weaker. We quote at \$24.50 @ \$25, with a sale of 1000 tons reported at \$24.50. The continued mild weather is an element of weakness to the market, as the work of lifting has not yet been stopped, as it was expected it would have been before this, and then the fact that there is so little difference between the cost of new Steel and the price of Old Iron Rails that there are more being taken up than there otherwise would have been. It is an easy matter for railroads having Old Iron Rails to replace them with new Steel Rails when the former are worth within \$3 as much as the latter.

Steel Rails.—We are advised of some small sales at \$28, cash, at mill, at which price the market is steady for lots of from 1000 to 5000 tons. When it comes to larger blocks it is probable that the price quoted would be discounted somewhat.

Billets, &c.—There is not much inquiry at present for Bessemer Steel Billets, and they are quoted weak at \$28.50, cash. Nail Slabs are quoted at \$27.75 @ \$28; Domestic Bloom and Rail Ends, \$19 @ \$19.50.

Railway Track Supplies.—There is not much inquiry at present, but there may be an improvement in the demand before long. No change in prices. Spikes, \$2.10, 30 days; Splice Bars, \$1.80 @ \$1.85; Track Bolts, \$2.80 with Square and \$2.90 with Hexagon Nuts.

Old Material.—There is no improvement in demand, and no important change in prices. Sales No. 1 Wrought Scrap at \$21 @ \$21.25, net ton; Wrought Turnings, \$14 @ \$15; Car Axles, \$25 @ \$26; Cast Scrap, \$15.50 @ \$16, gross; Cast Borings, \$12 @ \$13; Car-Wheels, \$20; Old Steel Rails, short pieces, \$18.50; long lengths, \$20.50.

Chattanooga.

Office of *The Iron Age*, Carter and 9th Sts., CHATTANOOGA, January 7, 1889.

Pig Iron.—The new year, so far, has not developed anything new, and matters are running along about as they have been doing the past few weeks. One of the most unfavorable signs at present is the continued accumulation of stocks at some of the furnaces. While some of the furnaces are keeping their yards entirely bare, others are piling up Iron, chiefly because they are not getting the price they ask, and are putting it away. Of course the condition of prices in the future will much depend upon the action of these parties. If they have the backbone, fortified with plenty of money, to hold their output, there will not be much change in prices in the near future, and should there be the active demand for consumption that everybody seems to expect, the Iron will be quickly absorbed without disturbing the market. Sales or shipments that are now being made (without reference to previous contracts) are now realizing from 50¢ to \$1 less per ton than, say, two or three months ago, and upon these prices the market is quite active, with sales in round lots of 500 to 2000 tons; two sales, aggregating 1200 tons, of Nos. 1 and 2

Foundry, to go to Denver, were made a few days ago at private terms. Southern foundries have commenced sending in their orders quite freely, and a good demand is looked for from that quarter.

Detroit.

WILLIAM F. JARVIS & Co., under date of January 7, 1889, report as follows: The active demand which was so confidently expected on the opening of the new year has not been fully realized. While sellers are not trying to force sales, the fact of one sale of 10,000 tons of Southern Gray Forge for delivery running through 1889 having been made at a very low figure has given buyers the impression that prices on Coke Irons will not advance, as has been generally predicted, and that a lower level is likely to be reached. Considerable inquiry for Lake Superior Charcoal is being made, and some orders for round lots have been taken for delivery during the next three or four months. While the market is not buoyant, yet on most grades prices are still held firm, and we quote as follows:

Lake Superior Charcoal, all numbers.....	\$20.00 @ \$20.50
Lake Superior Coke, all ore.....	19.75 @ 20.25
Lake Superior Coke, cinder mixed.....	18.00 @ 18.50
Standard Ohio Black Band.....	19.75 @ 20.25
Southern No. 1.....	17.75 @ 18.25
Southern Gray Forge.....	15.25 @ 16.25
Southern Silvery.....	17.00 @ 17.50
Jackson County (Ohio) Silvery.....	18.50 @ 19.00
Old Wheels.....	20.25 @ 20.75

Coal Market.

The Anthracite Coal trade is very dull, and producers appear to be fully alive to the situation threatening their interests, from the fact that restriction at the mines is now severely enforced to prevent accumulation and uphold prices. For the week ended December 29 the total production was only 474,382 tons, not one-half as much as was sent to tidewater during some weeks in the autumn months. Compared with the preceding week the decrease is 144,000 tons, and compared with the corresponding week last year the decrease is 104,000 tons. The aggregate for 1888 to the 29th ult. is 38,111,923 tons, against 34,866,870 for the same time in 1887—increase about 4,300,000 tons. The *Philadelphia Ledger* says: "There is very little inquiry at present for Coal, excepting from the iron furnacemen in the Schuylkill and Lehigh valleys, some of whom are clamorous for the Furnace sizes, and have been compelled to use Broken Coal to mix with Lump and Steamboat. While lump Coal is in urgent request, owing to the large number of iron furnaces now in blast, yet that size commands only \$2.10 per ton at the mines from the furnacemen, while other consumers are asked to pay \$2.75 per ton. The contracts for supplying the iron furnaces are filled almost entirely by the larger producing companies, who are enabled to sell their Coal at that figure because their railroads get the haul on Iron Ore, Limestone, &c., and Pig Iron to and from the furnaces. Recently, some individual mine operators have been reported as refusing to fill orders for Lump Coal at \$2.10, preferring to rebreak their large Coal into the domestic sizes, which are said to yield a better return, but we are informed that an individual has been furnishing Lump Coal to the Phoenix Iron Company at \$2 at the mines, which is unusually low. The Traction Company of Philadelphia, closed a contract for 10,000 tons of Pea at, it is stated, \$2.80 per ton. New York quotations are unchanged. Individuals outside cut prices an average of about 25 per cent.

The Bituminous Coal market is dull and fully supplied. Another meeting of the Seaboard Association was held to discuss plans with reference to the Coal

pool to go into operation March 1, but the adhesion of the Beach Creek Company was not received. Cumberland shipped last week 81,000 tons and Clearfield 51,000 tons.

Barges and canal boats in the future, when traversing other than inland waters, must take out from the Custom House of the port in which they are owned regular official Government papers of registration. The decision of the Treasury affects all railroad barges traversing Long Island Sound, and causes much feeling.

New York.

Office of *The Iron Age*, 66 and 68 Duane street, NEW YORK, January 9, 1889.

Foundry Pig.—The week has been very uneventful, no announcement of opening prices having yet been made. Reports from consumers vary widely. Some foundries are rushed with work, others have little or nothing to do. Bids have been asked for the Iron for a lot of 4000 tons of castings for a purpose which has not yet been revealed. There is considerable complaint of cutting, on the part chiefly of Southern producers, \$17 for No. 1 and \$16.25 for No. 2 being named as having been done. It is asserted, however, that this is for unknown brands and for irregular grades. We quote standard Northern No. 1 Foundry \$18 @ \$19, and No. 2 \$16.50 @ 17.

Scotch Pig.—Except for the fact that a 150-ton lot of Scotch Iron, sent on consignment, is somewhat eagerly seeking a purchaser, there has been nothing of interest. We quote: Coltness, \$20.50 @ \$21; Shotts, \$20.25 @ \$20.75; Langloan, \$20.25 @ \$20.50, Summerlee, \$20.50, asked, and Dalmellington, \$19.50 @ \$19.75.

Spiegel Eisen.—The market is difficult to quote, the prices abroad differing widely according to the condition of the business of each individual maker. Scarcity of Manganiferous Ore and a good European demand are stated to be the causes of higher asking prices. The only sale of any consequence reported is a lot of 1000 tons of 80%, at private terms. We quote nominally \$28 @ \$29 for English 20%; \$33 @ \$34 for 30%, and \$55 @ \$55.50 for 80% Ferromanganese.

Plates.—We quote Iron Tank, 2¢ @ 2.2¢; Shell, 2.25¢ @ 2.4¢; Steel Tank and Ship Plate, 2.15¢ @ 2.25¢; Shell, 2.35¢ @ 2.5¢; Flange, 2.6¢ @ 2.75¢, and Fire-box, 3¼¢ @ 4¢.

Structural Iron.—The great event of the week has been the reduction in the combination price of Beams and Channels from 3.3¢ to 2.8¢, delivered. We discuss the subject editorially. We quote Sheared Plates, 2¢ @ 2.1¢; Universal Mill Plates, 2.1¢ @ 2.2¢; Angles, 2¢ @ 2.10¢; Tees, 2.5¢ @ 2.6¢, and Channels and beams, 3.3¢ on dock for all sizes.

Bar Iron.—We quote: Carload lots on dock, half extras, Common; 1.7¢ @ 1.75¢; Medium, 1.75¢ @ 1.8¢, and Refined, 1.8¢ @ 2¢.

Steel Rails.—There have been only a few small sales at private terms, for Southern delivery. The market is dull, with nominal quotations at \$28 at Eastern mill. It is stated that the cutting of this price is disguised by the guaranteeing on the part of the mills of exceptionally low freight rates, on which they must finally adjust differences.

Merchant Steel.—The market continues weak, with a very moderate volume of business. We quote Tire Steel 2.05¢ @ 2.15¢ delivered, 60 days flat, for ½" and heavier. Spring Steel, 2.25¢ @ 2.50¢; Machinery, 2.15¢ @ 2.25¢, and Shafting Steel, base sizes, 2.2¢ @ 2.25¢.

Wire Rods.—Some business has been done between \$41 and \$41.25, and \$41.50 @ \$42 is now asked. Low sellers abroad are out of the market, and some of them have turned to other forms of Steel, which they claim pays them better than Rods even at present prices.

Old Rails.—In the absence of business we continue to quote, nominally, \$23 @ \$23.50 for Tees.

Track Material.—We quote Spikes weak at \$2.10 @ \$2.15, and Angle Bars, 1.85¢ @ 1.9¢, delivered.

G. W. Stetson & Co., 69 Wall street, this city, and Edmund D. Smith, & Co., of 222 and 224 South Third street, Philadelphia, have been appointed exclusive sales agents of the Pig Iron produced by the DeBardeleben Coal and Iron Company, of Bessemer, Ala. A feature in the manufacture of this Iron is that the furnaces have six Pig beds, so that each cast is allowed to cool naturally, thus avoiding the chilling tendency from artificial cooling.

Metal Market.

Copper.—Since our last week's report London suddenly improved with Chili Bars on the spot to £78. 10/, an advance of 25/, but has since dropped back to £77. 15/, futures remaining £78 for both Chili Bars and good merchantable, and the latter being called £77. 15/ against £77. 5/ a week ago; sales 520 tons. Best selected gave way from £80 to £79. 10/. The market is wholly inactive here at nominally 16½@17½¢ spot; for near futures, 17½@17½¢ is asked and 17¢ bid. The syndicate was estimated to hold 110,000 tons of Copper in Europe on the 1st instant. The Lake Copper production last year is figured at nearly 86,000,000 lb Fine against 75,471,800 the previous year, and 79,890,798 lb in 1886.

Tin.—Has been looking up again in London after the first bad effect of unfavorable statistics was overcome. The visible supply in Europe and America on the 1st inst. was 13,878 tons, against 12,478 on December 1, 1888, and 18,094 on January 1, 1888. From £97. 17/6 London rose last week to £98. 15/ this morning, and futures from £98. 12/6 to £99. 10/. Sales 500 tons. The only sales which transpired in this market were 10 tons spot, at 22¢, and 10 tons February at 22.15¢. Spot closes to-day at 21½¢ @ 22¢. As per cable direct from Gilfillan, Wood & Co., Singapore, to Mr. Charles Nordhaus, East India agent, 89 Water street, New York, the shipments of Tin from the Straits Settlements to the United States in December last were 1200 tons, against 600 the previous year; to England, 2090 and 1500 respectively; total last year this way, 3850, against 4250 in 1887, and 18,900 against 17,280, to England. Thus the aggregate shipments run up 22,750 tons in 1888, as compared with 21,000 tons in 1887; increase, 1250 tons, which certainly is less of an increase than might have been expected, and may therefore be looked upon as a favorable statement.

Tin Plates.—Though not more active, Tin Plates have been held with greater firmness in view of a Birmingham meeting of makers to come off to-morrow. We quote at the close, large lines, 3 box: Siemens-Martin Steel, Charcoal Finish, \$4.75 @ \$5.50; Coke Finish, \$4.65 @ \$4.70; Terns, \$4.12½ @ \$4.25; Coke Tins, \$4.22½ @ \$4.30; and Wasters, \$4.12½ @ \$4.15. Liverpool is unaltered, 13/3 Coke. The total exports from England to this country during the first 11 months of last year have been 271,037 tons, against 247,042 in 1887 and 242,130 in 1886, as per Board of Trade returns.

Lead.—On the 3d inst. 830 tons of Common Domestic Lead were sold at auction at 3.85½¢ and 3.86¢ to a dealer who

thought perhaps he could make a good thing of it till the money was due, to-morrow, but the market soon after weakened again and 200 tons were sold at private sale in the open market at 3.90¢ @ 3.85¢, the latter figure now being bid and no more. The Western markets are 3.55¢. In London, meanwhile, Soft Spanish has been steady at £13. 2/6, while English Pig improved from £13 to £13. 5/.

Spelter.—Has been featureless and dull at 5¢ for Domestic, and 5.90¢ @ 6¢ for Silesian, the latter rising in London from £18. 5/ to £18. 12/6, because of the prospects of a renewal of the International Syndicate agreement in Europe for three years and a half, to date from July 1 next.

Antimony.—With a moderately active demand, there is no change since our last; we quote Cookson 13¢, and Hallett 11¢, the latter remaining £45 in London.

Financial.

Financially, the most important event of the week was the adjourned meeting of the bankers and railroad presidents in this city, to devise a plan for the prevention of rate wars in future and to bring the roads represented into permanent adjustment with one another upon a remunerative basis. The presidents renewed their determination to maintain rates, and in furtherance of this object a committee was appointed to prepare the necessary papers, also to confer with the Interstate Commerce Commission as to the legalities of any plan that might be proposed. The committee, to report on Thursday (to-day), are: President Charles Francis Adams, Union Pacific; Vice-President Frank S. Bond, St. Paul, and President William B. Strong, Atchison. One of the bankers who attended the conference said: "The work is already done so far as the prevention of rate wars is concerned. You will hear of no more rate wars. Before the term of the present preliminary agreement expires the formal plan will be put into operation."

For the first week in the new year trade has been good, considering the adverse weather conditions, and indications generally are of a hopeful character. The weekly compilation of bank clearances in all the leading cities shows a gain of 14.3 % in the volume of business compared with the corresponding week in 1888, and this notwithstanding the quietness in most of the speculative markets. In New York City the increase was 18.8 %, and outside of New York 7 %. Special activity is noticed in San Francisco, Minneapolis, Denver and Kansas City. The larger Atlantic cities all show moderate gains, while there is a decrease at New Orleans, Galveston and Norfolk. In New York among dry goods jobbers the week has been one of readjusting and preparation, with a firm market, an increasing number of buyers present, and in prints and some descriptions of woolen goods there is a slight advance. Grocery jobbers notice an uncertain feeling, but coffee started the year with a boom, but afterward sold off; sugars tend steadily downward; teas hold a strong position. Cotton advanced ¼¢ @ ½¢ lb, but shows reaction on large port arrivals. Provisions are irregular under speculative influences, with increased exports, comprising heavy shipments of lard and bacon. Flour fails to find an outlet to any extent on export demands. A feature in wheat was the taking of 48,000 bushels at Baltimore for Antwerp. Corn is going out in large quantities. About 3,500,000 bushels are under contract at Baltimore. A well-known grain exporter, who returned from a six months' absence on the other side, said the English markets can get along without our wheat for

three months more, and by that time the wheat exporting countries south of the equator will be in the world's market with a new crop, so that there is some new source of supply to draw from the year around, instead of six months between crops north of the equator, when Europe was dependent upon America, as formerly. At Washington there is talk about a permanent tariff commission, to avoid injury to business interests arising from continued agitation in Congress.

The Stock Exchange markets were variable, and showed little improvement. Much stress was laid upon the conference of the presidents of the roads and leading bankers, noted above, in expectation that there would be a full explanation of the trouble which led to the cuts by the Missouri Pacific and Rock Island last week, and that additional measures would be adopted looking to a closer adherence to the rate schedules in future.

The weekly statement of the associated banks showed an increase of \$1,051,750 in surplus reserve, which now amounts to \$7,333,100, against \$10,826,725 at the corresponding time last year and \$14,786,675 in the second week of January, 1887. The comparison is still unfavorable, but this fact is without significance in the present state of the money market. In loans there was an important expansion of \$3,538,500. Specie increased \$511,200, and the further effect of the flow of currency from the interior was seen in the increase of \$2,691,000 in legal tenders. The feature of the statement was the increase of \$8,601,800 in deposits, which is accounted for by the large corporation payments for interest, dividends, &c., during the week. Money has been gradually growing easier, and is now about normal. Quotations for time loans on prime security were 4 @ 4½ %, 60 to 90 days, and longer dates 5 @ 5½ %. Commercial paper is less active, and in very moderate supply.

The imports of merchandise at this port during the week were much larger than for the corresponding week in several previous years, the total valuation being nearly \$12,000,000, of which \$3,370,000 represents dry goods.

According to the custom house report the exports of specie from this port last week were \$412,000 and the imports were \$63,000.

The Sugar Trust and all other trusts received a severe blow on Wednesday in the decision of Justice Barrett, of the Supreme Court, declaring that the North River Sugar Refining Company, one of the principal parties in the combination, had forfeited its charter.

British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, January 9, 1889.

There have been no new developments in the market for Block Tin, and the movements of prices are attributed mainly to the drift of sentiment as swayed by statistical exhibits and reports as regarding the movement from the East. Large shipments last month increased the visible supply about 1000 tons, and encouraged "shorts," but the natural effect of this was partially offset by good control of spot supplies by a comparatively few firms. Speculation is confined within a narrow circle, for the most part, and consumers' purchases are gauged almost wholly by imperative wants.

A demand for cash Chili Bar Copper warrants to cover sales of futures that

matured the early portion of the month led to an advance in the same to £78. 10/, futures meanwhile remaining stationary at £78. Since these wants were covered the price has shown a weaker tendency. Speculation is still of a contracted character. Purchases for consumption are restricted to absolute need, as manufacturers have not the confidence in the stability of prices to stock up anyway liberally in view of the statistical position. The syndicate has reduced its buying price for "good Merchant brands" 5/.

In the Tin Plate market the situation has not changed. Makers are inclined to firmness in view of the condition of the market for Bars, and for Block Tin, but the demand is hesitant and buyers' views are low. There is a general inclination to await the quarterly meeting before accepting orders of any considerable volume. The stock at British shipping ports is estimated at 308,000 boxes, against 208,000 a year ago.

Transactions in Pig Iron warrants have been moderate and reflect some lack of confidence in an important advance in prices with the stocks as large as at the present time. The rate charged for carrying also tends to check outside buying to no little extent. Makers' brands have had fairly active sale, but at rather lower prices. Middlesboro' Pig and Hematites are lower, however, and not as firm as last week.

In the Steel trade business continues brisk for the most part, and prices are very firm throughout. Makers ask 2/6 advance on Billets, Wire Rods and Crop Ends.

Scotch Pig.—A fairly active business, but at somewhat irregular prices.

No. 1 Coltness, f.o.b. Glasgow	51/
No. 1 Summerlee, " "	50/
No. 1 Gartsherrie, " "	49/
No. 1 Langloan, " "	50/
No. 1 Carnbroe, " "	44 7/8
No. 1 Shotts, " at Leith	49 7/8
No. 1 Glengarnock, " Ardrossan	48/
No. 1 Dalmeilington, " "	43 7/8
No. 1 Eglinton, " "	42/

Steamer freights, Glasgow to New York, 4/, Liverpool to New York, 10/.

Cleveland Pig.—Trade has been rather slow, but prices have not varied materially. No. 1 Middlesboro', G. M. B., 36/; No. 3 do., 33/9.

Bessemer Pig.—The demand has fallen off and prices are not as firm. West Coast brands, mixed numbers, 45/, f.o.b. shipping point.

Spiegeleisen.—There continues to be a fairly active demand and prices are firmly held. English 20 % quoted 80/, f.o.b. N. W. England shipping point.

Steel Rails.—The demand continues active and the market strong, without, however, any positive change in prices. Heavy sections quoted at £3. 19/6 @ £4, and light sections £4. 2/6 @ £4. 10/, f.o.b. at N. W. England shipping point.

Steel Blooms.—For these the demand is moderately active and the market firm. We quote £3. 18/6 for 7 x 7, f.o.b. at N. W. England shipping point.

Steel Billets.—Demand active and the market strong, with 2/6 advance, asked Bessemer, 2 1/2 x 2 1/2 inch, £4. 5/, f.o.b. at N. W. England shipping point.

Steel Slabs.—There is a good business at firm prices. Bessemer, £3. 18/6, f.o.b. at N. W. England shipping point.

Old Rails.—The market has remained quiet, and former prices are named.

Tees quoted at £3. 5/ @ £3. 6/, and Double Heads, £3. 8/ @ £3. 10/ c.i.f. New York.

Scrap Iron.—But little doing and prices unchanged. Heavy Wrought quoted at £2. 2/6 @ £2. 5/, f.o.b.

Crop Ends.—Supply on offer is moderate and held at higher prices. Bessemer quoted £2. 10/ @ £2. 12/6, f.o.b.

Tin Plate.—The market has been quiet pending the quarterly meeting. We quote, f.o.b. Liverpool:

IC Charcoal, Allaway grade	15/3 @ 15/6
IC Bessemer steel, Coke finish	12/6 @ 13/9
IC Siemens	13/3 @ 14/
IC Coke, B. V. grade	13/3 @ 13/6
Charcoal Terne, Dean grade	12/ @ 12/6

Manufactured Iron.—There is a good trade in all branches at steady prices. We quote, f.o.b. Liverpool:

Staff. Ord. Marked Bars	£ s. d. @ 8 2 6
Common	£ s. d. @ 5 12 6
Staff. Blk Sheet, singles	£ s. d. @ 7 12 6
Welsh Bars (f.o.b. Wales)	£ s. d. @ 5 2 6

Tin.—The market moderately active. Straits quoted at £99. 5/, spot, and £99. 15/ for three months' futures.

Copper.—Speculation livelier in cash Chili Bars. Otherwise the market quiet. Chili Bars, £77. 15/, spot, and £78, three months' futures. Best Selected, £79. 10/.

Lead.—A fairly active demand and the market firmer. To-day's quotation, £13 for Soft Spanish.

Spelter.—The market firmer with demand good. Quoted at £18. 10/ for ordinary Silesian.

Foreign Markets.

EQUIVALENTS.

Franc, Peseta or Lira	Cent.
Florin (Netherlands)	10.3
Florin (Austria)	40.2
Wired (Portugal)	35.9
Wired (Brazil)	1.08
Mark (Germany)	23.8
Allogram	Pounds
Picul	2.205
	134.

CHILI.

VALPARAISO, November 9, 1888.—**Copper.**—In spite of the favorable cable advices from England holders have been compelled by the rise in exchange to lower prices. The amount offered has not been large, as nearly the entire output of the year is now disposed of, sales thus being limited to 17,210 quintals at \$28 for Urmeneta, and \$28.30 for Lota, \$27.65 equaling £76. 14/ per ton, with 27/6 steam freight. **Nitrate.**—Some 587,000 quintals, mostly December-January shipment, have been sold at sustained figures, for the most part at \$2.95 for 95 %, which equals 9/6 1/2, with 32/6 freight. Little has been done for the United States, the limits being too low. The October shipments reached 79,000 tons for Europe, and 7000 for the United States, while there were loading on the 1st inst. 112,000 and 3500 tons respectively, the fortnight's charters being 25,000 and 2000. Coal continues improving; Newcastle, September sail, has been paid 41/, and Australian, January sail, 38/. **Exchange, bank drafts, 90 days' sight, are quoted 2 1/2 d.—Weber & Co.**

EAST INDIES

MANILA, December 31, 1888.—**Hemp.**—Our market is quiet at \$15 per picul, against \$9.75 last year, equaling £51. 15/ per ton, cost and freight, against £34. 7/6. The clearances for the United States since last cable have been 3000 bales, against none last year; since January 1, 241,000, against 246,000; there remain loading 25,000, against 12,000; cleared for England since January 1, 348,000, against 225,000; loading for do., 7000, against 3000; cleared for all other countries, 71,000, against 46,000. Receipts at all ports since January 1, 654,000 bales, against 527,000 and 398,000. **Freight, £7.50, against \$5.50. Exchange, 3/8 1/2, against 3/8.—Ker & Co., per cable direct to their agent, Mr. Charles Nordhaus, 89 Water street, New York**

COLOMBO, Ceylon, November 20, 1888.—**Plumbago.**—A moderate amount of trade has been transacted at sustained figures, which may be quoted at the close as follows, in rupees per ton:

Large Lumps, 145 @ 170; Ordinary Lumps, 125 @ 160; Chips, 80 @ 95, and Dust, 40 @ 65. There have been shipped since October 1 to England, 11,419 cwt.; to Hamburg, 851; to Antwerp, 609; to Australia, 38, and to the United States, 5389; together, 18,236 cwt., against 41,778 last year, 36,012 in 1886, and 26,874 in 1885. **Coir Yarn, Nos. 1 to 4, may be quoted 7 to 12 rupees per cwt. Exchange.**—We quote six months' sight credits, 1/5 1-16.—**Volkart Brothers, through their agent, John W. Greene, 82 Wall street, New York.**

SPAIN

BILBAO, December 18, 1888.—**Iron Ore.**—The market has become livelier; a good many sales for immediate shipment have been made, but by far the greater dealings have been in lots for forward delivery next year. The number of steamers ready to take cargo has increased, and at the Oreonera and Galdames drops extraordinary efforts have been made to push off as much Ore as could be got out of the mines. Prices have meanwhile been steady at 8/ @ 8/6 Campanil and 6/10 @ 7/3 Rubios. Total shipments since January 1 sum up 3,460,545 tons, against 4,089,861 in 1887. **Pig Iron.**—None but 300 tons have gone coastwise.—**Bilbao Maritimo y Comercial.**

SWEDEN.

STOCKHOLM, December 27, 1888.—**Iron Ore.**—The Swedish-Norwegian Railway Company now engaged in finishing the construction of the Lulea-Ofoten Railroad have just made a proposal to the Swedish Government to sell the latter the said railroad, to be delivered to the Government free of cost 20 years hence, the Government guaranteeing 4 % per annum interest during the interval jointly with Norway on an amount of £1,500,000. The Swedish Government engages not to levy an export duty on Iron Ore. The road to be finished by the company without further delay; 42 km. of it are on Norwegian soil, hence Norway has to be consulted in the matter and participate in it. The Iron Ore can stand a freight of 6/ per ton, and contracts have already been made to deliver 650,000 tons, which may be indefinitely increased as soon as the railroad is completed. Sweden is given the option; if it declines, a syndicate of powerful English bankers stands ready to buy the road.—**Dagbladet.**

BELGIUM.

BRUSSELS, December 29, 1888.—**Iron.**—The Belgian market remains steady, most works are fully booked for months to come. Cockerill has offered 3700 tons of Steel Rails to Roumania at 119 francs per ton, delivered at Galatz. Krupp came next with 122 francs, and Denain & Ougée with 124.25. A Liege firm has received an order for Corrugated Galvanized Roofing for the La Plata stores at Buenos Ayres, for which tenders were submitted from England, but too dear. The actual consumption of Pig Iron in Belgium in October was 78,064 tons. Cockerill received an order for four steamers to navigate the Volga, in Russia. There has been some dispute about the amount of Steel Rails consumed in and exported from Belgium in 1887; it now appears that the consumption has been 30,000 tons and the export 78,000.—**Moniteur des Interets Matériels.**

GERMANY.

HAMBURG, December 29, 1888.—**Iron.**—The year closes with an increased animation and strength in Pig Iron of all kinds, prices tending steadily upward, on the one hand in consequence of improved statistics, and on the other because the demand is getting brisker. The latter is especially the case with Spiegel, of which the domestic Steel works require additional supplies, because their business flourishes. Thus Spiegel has gradually risen from 53 to 56 marks per ton. Siegen still sells Forge Pig at 49.50, Rhenish-Westphalia at 51.50 No. 1. While both Foundry and Thomas are lively, Bessemer drags. English is 45/. The rolling mills have booked orders enough, but do not enhance their selling prices. Great preparations are being made by them to turn out any amount of Beams in order to meet the growing demand for the same; new machinery is in course of construction and additional works are about to be started, so that after a while overproduction is likely to take place. Boiler Plates remain as active as ever; not so Thin Sheets. The Wire Branch is slightly looking up. Machine shops, foundries and car works are all doing well. Upper Silesia also reports favorably in every respect. We quote Steel Rails 110 @ 120 marks, ditto for Mines, 115. **Metals.**—Lead is weaker at 13.13 marks; German Spelter steady at 18 @ 19, and Lake Copper 79 @ 80 marks per 50 kg.—**Borsenhalle.**

A new coal road now building will connect the Lehigh region, at Slatington, with the Poughkeepsie Bridge, and be 125 miles in length.

Hardware.

There has thus far been little movement in trade, manufacturers and merchants devoting their energies to the closing of last year's business and completing the arrangements for the coming season. In a good many lines manufacturers are well supplied with orders, the shipment of which will soon commence, but most manufacturers are desirous of securing business and have fair stocks on hand. The market shows but little change in its tone, prices not being especially strong, but steady.

Wire Nails.

The Wire Nail market is in an unsatisfactory condition, being characterized by a good deal of irregularity, manufacturers of Nails not agreeing upon the terms at which they are to be offered. Several of the mills are holding car lots at \$2.30, f.o.b. mill, and show a disposition to refuse to meet prices which have been and still are made by others. The market thus presents some indications of increased firmness, but buyers have been disposed to avail themselves of present offerings only to a limited extent, the impression prevailing that, under the stress of continued competition or the necessity for some of the mills to market stocks, prices may recede from their present unprofitably low point. Prices from store are also somewhat uneven, \$2.50 to \$2.60 being in some instances asked.

Cut Nails.

The New York market is very quiet, the volume of business being light. The tone, however, is reported to be a trifle better. We continue to quote carload lots on dock \$1.80 to \$1.90.

A meeting of the Western makers is being held at Wheeling to-day.

Miscellaneous Prices.

The following are the prices of the Auburn Mfg. Company, Auburn, N. Y., on Scythes, Hay and Straw Knives, Grass Hooks and Corn Knives:

Scythes, Solid Steel.

Grain.....dis 40&10 %
Grass (sharpened and boxed):
Honor Bright, per dozen, \$10.....dis 50 %
Acme, per dozen, \$9.50.....dis 50 %
Our Best, per dozen, \$9.50.....dis 50 %
Our Clipper, per dozen, \$9.....dis 50 %
Mowers' Choice, per dozen, \$9.25.....dis 50 %
Favorite, per dozen, \$8.50.....dis 50 %
Honest Dutchman, per dozen, \$8.50.....dis 50 %
Bush and Bramble, strawed, per dozen, \$8.22, dis 50 %

Hay Knives.

Common Point, list \$15 to \$16, dis.....50 %
Spar Point, list \$15 to \$16, dis.....50 %

Straw Knives for Cutting Boxes.

Polished Blade, list, \$15.....dis 40 %
Painted Blade, list, \$14.....dis 40 %

Grass Hooks (Sharpened and Boxed).

No. 2. No. 3. No. 4.
\$2.00. \$2.25. \$2.50.

Corn Knives.

Western Pattern, all steel.....per dozen \$2.00
Crescent, bent handles, shipped and boxed, per dozen 3.50

The following are the prices of the National Self-Heating Sad Iron, manufactured by the National Self-Heating Sad Iron Company, St. Louis, Mo., the list as given being subject to a discount of 30 per cent. on orders for one dozen Irons or more:

Per dozen.
7 and 8 pound Family Irons.....\$57.00
12-pound Tailors' Irons.....66.00
20-pound Tailors' Irons.....78.00

A description of this article is given on page 71.

The Moore & Barnes Mfg. Co., 103 Chambers street, New York, have recently purchased the Barlow patents on Door

Springs, Door Checks and Door Stop and Holder, and are now manufacturing the goods, which they intend to designate hereafter by the name of Phoenix. These goods are listed as follows, the discount being 50 per cent.:

Phoenix Hook Door Spring and Duplex Door Check.

For Hook Door Springs:	Japanned. Per doz.	Nickel plated Per doz.
No. 1, with strength sufficient for most doors..	\$4.00	\$8.00
No. 2, for very large heavy doors.....	5.00	9.00
No. 0, Screen Spring and for very light doors..	2.25	4.25

Duplex Door Check. Per doz.

Japanned.....	\$4.00
Nickel.....	6.00

Phoenix Door Stop and Holder.

No. 1, for general use, to go on the floor, Japanned.....	\$4.00
No. 2, for baseboard or side wall, Japan'd	4.00
Either of the above, Nickel-Plated....	6.00
No. 3, for very heavy doors, or for doors that swing over an inch above the floor, Japanned.....	4.50
No. 3, Nickel-Plated.....	9.00
Barlow's door fixtures, complete, per set.	.70

They are also making a Reinforced Sash Chain, which they allude to as having great strength. It is sold from the following list, which is subject to a discount of 50 and 10 per cent.:

	Per foot.	For sash of
Bronze Metal Chain, No. 1 list..	12c.	175 lbs.
Bronze Metal Chain, No. 2 list..	10c.	100 lbs.
Copper Alloyed Chain, No. 1 list	10c.	150 lbs.
Copper Alloyed Chain, No. 2 list	8c.	85 lbs.
Copper Alloyed Chain, No. 3 list	6c.	25 lbs.
Steel Metal Chain, No. 1 list...	8c.	100 lbs.
Steel Metal Chain, No. 2 list....	6c.	50 lbs.
Steel Coppered Chain, No. 1 list.	9c.	100 lbs.
Steel Coppered Chain, No. 2 list.	7c.	50 lbs.

They also are offering the Phoenix Window Cleaners and Floor Scrapers, the discount on which is 40 per cent.:

Phoenix Window Cleaners.

8-inch, per dozen.....	\$2.60
10-inch, per dozen.....	3.00
12-inch, per dozen.....	3.40
14-inch, per dozen.....	3.75
16-inch, per dozen.....	4.25
18-inch, per dozen.....	4.75

Phoenix Floor Scrubbers.

12-inch, per dozen.....	\$4.50
14-inch, per dozen.....	5.00
16-inch, per dozen.....	5.50

Their line of Vises, Bench Anvils, File Cards and Plumbers' Specialties are illustrated in separate circulars.

The manufacturers of Tackle Blocks have been conferring and have reached conclusions which are regarded as satisfactory and tending to regularity in quotations.

The manufacturers of Heavy Hammers and Sledges have been in session and have formed an organization, with Fayette R. Plumb as president. No change has been made in list prices, but an advance of about 10 per cent. was made, to go into effect at once. This action and the understanding which exists between the manufacturers is regarded as putting this line of goods in a more satisfactory condition than it has occupied for some time.

A slight advance in Shot has been made, as noted in our Current Hardware Prices.

The following are the prices of the Empire Sash Cord Fastener, described on page 6, which is manufactured by the Empire Portable Forge Company, Cohoes, N. Y., the list as given being subject to a discount of from 55 to 60 per cent., f.o.b. Cohoes, N. Y., 30 days, or 2 per cent. discount for cash in 10 days.

No. 1, for ¾-inch Auger Hole, per gross.	\$1.00
No. 2, for 1-inch Auger Hole, per gross.	1.25

Trade Topics.

A leading Western jobbing house who have been handling a well-known English Tape Measure, having a number of them returned on account of inaccuracy, reported the matter to the importing house from whom they were purchased. The Tapes in question were from ¼ inch to nearly 1 inch short. The importing house desired their return that they might be replaced with Tapes of the proper length, but on referring the matter to the manufacturer in England they received the following reply:

We have examined them (the Tapes) carefully. They are short respectively 3-10, 7-10 and 8-10 inch. They are of good average quality and we can find no fault with them. They want no repairing and are as good as the day they were made. We have often explained that we cannot be responsible for the contraction complained of. All woven Tapes are liable to it, and your friends might as well return every one.

In view of these facts it will be well for the trade to scrutinize closely the accuracy of such Tapes as they are handling, and also to recognize the inaccuracy which is considered by the English manufacturer as reasonably to be expected in the goods. The inaccuracy will, however, be generally regarded as introducing an element of uncertainty in measures which might result in considerable confusion unless carefully guarded against.

A New Hampshire manufacturer making a line of Cutlery and Tools writes as follows with reference to the relative advantages of selling to jobbers and retailers:

We sell to retail trade to some extent, but less than formerly. At the outset we found it the very best way to introduce our goods into the market and thus create a call for them by the jobbers. As a general rule we believe the best and cheapest way to distribute goods (in our line) to the consumer is for the manufacturer to sell to jobber and he to retailer. We notice that a great many goods are being sold through agencies, but we much prefer to sell to the jobber who buys his goods and pays for them and carries his own stock. It has never been our ambition to "beat the world" in the matter of prices, but we design to make first-class goods and guarantee to every customer the worth of his money.

From Louisville, Ky., we have the following report under date January 7:

For the past week the Hardware trade of Louisville, Ky., has been fairly up to expectations, and quite satisfactory in every way. Continued low prices rule, but the amount of goods going into consumption shows what good crops and an open winter will do for the trade. When there is such a good demand, it is a mystery to the jobbers why some of their number should sell Nails at extreme low prices as reported; in fact, far below what they could be bought to-day at in large lots from the factories; this has demoralizing effects on the buyers, yet the heavy trade goes on.

The mills have nearly finished delivering their low-priced Nails, and the trade expects them to hold firm and perhaps advance a little at the next meeting, which might be justified by the demand, but hardly by comparison with other lines of manufacture.

Wire Nails are decidedly off, so is Barb Wire, and it will be hard for either to recover for some time.

Bar Iron is in steady demand, and considerable Hoop Iron has been placed, principally on account of the tremendous crop of Kentucky whiskies being made. The largest cooperage establishment in the Southwest, Chess & Wymond, in this city, have contracted for their entire capacity of barrels for the year. The cooperage required alone for the Kentucky whisky crop will take about 50,000 barrels.

Items.

The Lufkin Rule Company, Cleveland, Ohio, have discontinued their agency in Chicago with H. H. & C. L. Munger, and hereafter their goods will be shipped and billed direct, and at the same time they will equalize on their freights with Chicago. They will be represented during this year by S. A. Haines & Co. 90 Chambers street, New York. The Southern States

will be covered by D. A. Goodrich, and the Western and Northwestern States by S. A. Haines and J. C. Hollis.

The Rogers & Hamilton Company, Waterbury, Conn., have an exceedingly attractive calendar, brilliantly printed in colors. The fact that it gives the name of the company in only an unobtrusive manner and does not allude to the goods of their manufacture, will doubtless be appreciated by those who receive it, while at the same time it will be none the less a reminder of their products, which will make it serve its purpose efficiently.

The LePage Company, Boston and Gloucester, Mass., make the following announcement under this date:

We have contracted with Tower & Lyon to represent us as salaried agents to the trade throughout the Middle, Western and Southern States, together with such export and Canadian business as they may obtain. Tower & Lyon will have the exclusive control of all business in this territory for our account. We solicit for them the courtesies of the trade.

Referring to the above, Tower & Lyon state that they have consented to make a change in their Glue connection, their Mr. Tower having been connected with the Liquid Fish Glue business since its commencement, when Mr. LePage invented the several processes prior to organizing the Russia Cement Company, and it is intimated that to Mr. Tower is largely due the putting up of this Glue in tin packages for convenient handling by the trade. Reference is also made to the quality of the Glue made by the LePage Company, and the agents offer their personal guarantee that the Glue will be clear in color, perfectly preserved and entirely satisfactory.

The changes which are constantly taking place in the Hardware trade in the interesting additions that are made to the line of goods offered are indicated in the extra pages which have recently been issued by W. Bingham & Co., Cleveland, Ohio, for insertion in their catalogue of May, 1886. These pages, which are fully illustrated, represent a large variety of goods, including many novelties, together with some leading lines. The enterprise of the house is also shown in these additions to their assortment of Hardware.

The Ames Sword Company, Chicopee, Mass., supply the trade with their patent Perfection Padlock and Key Holder, mounted in attractive form, a dozen of the goods being attached to a handsomely printed card of suitable design, which makes an effective display when appropriately hung in the store. These articles consist of a miniature Padlock and Chain for holding keys.

Gille & Van Peyma, Kansas City, Mo., agents and dealers in Iron and Steel, Carriage and Heavy Hardware, Blacksmiths' Tools, Springs, Axles, Wheels, Wagon and Carriage Woodwork, &c., issue a very convenient and creditable price list and catalogue. It is a neatly printed volume of 300 pages, with some blank pages inserted at the close for memoranda, &c. Illustrations and list prices are given, with the intimation that net prices and discounts will be quoted on application. They also call attention to the fact that they manufacture a line of Wagon Material and Hardwood Lumber which they are in a position to offer on advantageous terms. In their introductory circular to the trade they make the point that no business can be successful without a liberal mail order trade, which they solicit, stating that they will always bill goods at as low prices as they believe they can be bought in any market, with difference of freight added.

The John W. Ealy Company, 278 and 280 Broadway, New York, have issued their twenty-second volume of Ealy's Blue

Book, bearing date January, 1889. It contains a classified list of names with financial worth and pay ratings of merchants, manufacturers and dealers throughout the United States and Canada in the special lines of trade mentioned, it being devoted especially to the Metal, Hardware and related trades, with an extension, however, into other lines, making each issue more complete and satisfactory than its predecessor. In the book under review, a modification has been made by which, by means of a special mark, dealers in Hardware, Stoves, Guns or Sporting Goods are specially designated, so that the names of such merchants can readily be recognized.

The Athol Machine Company, Athol, Mass., issue an illustrated catalogue and price list representing the Visco, Meat Choppers and other specialties of their manufacture, and also the Tools of the Standard Tool Company, with whom it is stated that they have made arrangements for the exclusive sale of their goods. This price list, representing as it does both lines, is designed to supersede all previous catalogues issued by the company, and they direct special attention to the several new Tools and specialties which are illustrated in it.

Henry Seymour Cutlery Company, Holyoke, Mass., have issued a new catalogue in which they call attention to the fact that their business has been established 50 years, the first page of the elegantly printed pamphlet containing the dates 1839-1889. Wiebusch & Hilger, Limited, are mentioned as sole agents, 84 and 86 Chambers street, New York. The list shows the company's well-known line of Shears, Scissors and Sheep Shears, the list prices being given. They also issue an effective hanger for the office or store, calling attention to their line of goods and the half-century in which they have been on the market.

Among the novelties put on the English market is a new Padlock called the Swivel, the object of which is to simplify the operation of locking. The swivel is reversible, so that the shackle can be opened from either side. A further advantage in the new Lock is that, owing to their being no open space by the shackle, moisture is effectually excluded. Another English manufacturer is putting up Sash Cord in boxes, which have a broken hole in front, through which the end of the cord passes. This system is referred to as largely adopted by other English manufacturers, and is said to be far preferable to the old method of doing up the goods in hanks.

L. W. Ferdinand & Co., Boston, Mass., issue a circular devoted to Galvanized-Iron Goods and Lanterns, in which they illustrate Water Pails, Garbage Cans, Coal Hods, &c., and Tubular and Station Lanterns.

Thomas Laughlin & Son, Portland, Me., send out in convenient form price list of Tackle Blocks and Iron and Lignum Vitæ Sheaves, with illustrations, among which is one of their Automatic Link Snatch Block, which we described in our last issue.

Announcement is made by Francis J. P. Tompkins, 116 Chambers street, New York, under date January 1, that he has formed a copartnership with Walter Adams, and that hereafter the business will be conducted under the firm name of Tompkins & Adams. The advertisement of the new house will be observed on page 43, calling attention to the lines in which they are specially interested.

C. F. Guyon & Co., 99 Reade street, New York, have been appointed sole agents for the sale of the Imperial Spring Adjusting Window Screens with patent fly attach-

ment. This article is manufactured by C. J. Shirreff & Co., Morristown, N. Y., and is alluded to as a novelty embodying many original features which will secure for it the attention of the trade.

L. M. Blue, Marysville, Ohio, representing the Van Wagoner & Williams Company, will leave for the West this week, and his many friends among the large trade may anticipate the pleasure of seeing him in due time.

Albert L. Brockway, who has been for 19 years a traveling salesman for Sargent & Co., and is thus widely known to the trade, has resigned his position, and is going, we understand, to Kansas to devote himself to his personal interests there. He issues a graceful circular letter to his friends announcing this change and referring pleasantly to his relations with Sargent & Co., and commending his successor to the attention and patronage of his customers.

Carlin & Fulton, 309 West German street, Baltimore, Md., were obliged by the requirements of their business to remove from their old location, where they had been for so many years, to their present more commodious quarters, where they carry an especially complete stock of General Hardware. One floor is devoted to the storage of Buck Thorn and the Iowa Barb Wire, Iron, Steel and Wire Nails, Horseshoes and Chains of all kinds. On the other floors are stored Agricultural Goods, Mechanics' Tools, Building Hardware, Cutlery and Guns. The entire second floor is one large sample-room, where the goods are displayed in a most attractive and convenient manner. The offices are on the first floor, and with the advantages of three hydraulic elevators, speaking tubes, electric bells and other modern appliances their business can now be transacted with greater comfort both to themselves and their customers.

The catalogue of the Phoenix Wire Works, Detroit, Mich., illustrates the extensive variety of Wire Goods, Crestings, &c., made by them. They are about moving into new and more commodious quarters, corner Fourth and Porter streets, Detroit, Mich., and will make a specialty of Wire Cloth, Riddles and Casting Brushes. They report a very satisfactory trade in their specialties.

The Western File Company, Beaver Falls, Pa., issue a very convenient calendar of moderate size, but with the dates clearly printed so as to make it suitable for desk or office use. In calling attention to their Files and Rasps, they emphasize their new Horse Rasp, Western, 1888.

One of the most elegant and artistic catalogues is that issued by Plumb, Burdick & Barnard, Buffalo, N. Y. In it are given price lists of Bolts, Coach Screws, &c., with illustrations, together with reproductions of their labels, which are accurate both in color and size. The paper is of very fine quality, and the different colors which are used in printing the catalogue, and the taste with which it is gotten up, make it a very attractive addition to trade literature. It is certainly very creditable to the manufacturers, and to Matthews, Northrup & Co., Buffalo, by whom it was printed.

C. M. McClung & Co., Knoxville, Tenn., issue a price current of seasonable goods for the spring trade. It relates to Plows, Hoes, Hames, Chains, Horse Collars, Double Sheaves, Plow Stocks, Feed Cutters, Mattocks, &c. It is well printed in attractive form.

McIntosh, Huntington & Co., Cleveland, Ohio, gave a banquet to their employees at the Cate Windsor on the evening of January 3. It was attended, we are advised, by more than 100 gentlemen

connected with the house, including 90 men employed in the store and 14 traveling salesmen. After supper Mr. McIntosh, the senior member of the firm, made a short opening address which was filled with happy hits. He was followed by Mr. Hord with a speech of welcome, which was responded to by A. B. Cotton on behalf of the employees. The next half hour was devoted to impromptu speeches, which were interspersed with music. The remainder of the evening was devoted to social enjoyment.

The A. F. Sharpleigh Hardware Company, St. Louis, Mo., issue a new page for their catalogue, describing the Detroit Sure-Grip Tackle Block. We are advised that the company carry a full line of these goods and are doing a large business in them.

An illustrated catalogue and price list of Carriage Hardware has been issued by the E. D. Clapp Mfg. Company, Auburn, N. Y., bearing date 1889. It is elegantly printed, appropriately illustrated, and shows a number of additions since their last catalogue was published.

The Standard Fibre Ware Company, Mankato, Minn., issue an eight-page circular describing their Standard Fibre-Ware and illustrating the different goods of their manufacture, such as Water, Dairy and other Pails, Slop Jars, Coolers, Cuspidors, &c. Their general agencies are at 67 Washington street, Chicago, Ill., and 109 California street, San Francisco, Cal.

The T. B. Harkins Foundry Company, Bristol, Pa., are about putting on the market a full set of round cast Washers, from $\frac{1}{4}$ to 2-inch. The neatness and smoothness of the castings are especially referred to, and the size of each Washer will be cast on it. They are also prepared to make special sizes and shapes to order.

The multiplicity of catalogues and price lists issued has led to the organization of a new company, the object of which is to supply in one volume catalogues issued by several different manufacturers who make the same line of Machinery or tools. This company is the American Catalogue Company, Minneapolis, Minn. This arrangement of putting the catalogues suitably classified in different volumes is referred to as advantageous for those who use, as well as those who issue, catalogues.

Announcement is made under date Cincinnati, January 1, that the firm of Kruse & Bahlmann has been dissolved, and that their business will be continued by the Kruse & Bahlmann Hardware Company, at 11, 15 and 17 West Pearl street. The officers of the company are as follows: Louis Kruse, president; Herman Bahlmann, vice-president; Louis Kruse, Jr., and Felix Bahlmann, general managers; Chas. Kruse, treasurer; Geo. W. Klein-schmidt, secretary.

M. Kunkel & Co., 114 South Franklin street, Chicago, dealers in Cabinet Hardware, sold their business on the 1st inst. to F. A. Rauch & Co., who will continue at the same location. The new firm will be composed of F. A. Rauch, formerly traveling salesman for M. Kunkel & Co., and Geo. L. Lamping, formerly with A. Rauch, furniture manufacturer, of Chicago.

Bennett & Shirk, 112 and 114 Lake street, Chicago, have in press a new catalogue of the North Star Refrigerators manufactured by the Indiana Mfg. Company, of Peru, Ind., and of which they are the selling managers. It will be ready for distribution to the trade in a few days.

The A. Treadway & Sons Hardware Company, incorporated under the laws of Iowa, succeeded on the 1st inst. to the firm of Andrew Treadway & Sons, dealers in general Shelf and Heavy Hardware, at Dubuque, Iowa. The original firm began

business in 1853. The officers of the new company are as follows: A. Treadway, president; A. W. Treadway, vice-president; H. E. Treadway, secretary; John Treadway, treasurer.

The firm of Park, Crancer & Co., of Leavenworth, Kan., dissolved on the 1st inst. by limitation, J. W. Park retiring from the firm. The business will be conducted by J. W. Crancer, E. W. Crancer and J. T. Johnson, under the firm name of J. W. Crancer & Co., who will carry one of the most complete stocks of Shelf and Heavy Hardware, Tin Plate and Tinner's Supplies in the State.

The Enterprise Mfg. Company, of Akron, Ohio, and St. Paul, Minn., are now said to be the largest exclusive Fishing Tackle manufacturers in the United States. Their Eastern depot is located at Akron, and a branch factory has recently been put in operation at North St. Paul. In the latter establishment they manufacture the Eagle brand Horse Sweat Pad with the following improvements: 1. An elastic Buckle Spring, easily adjusted to large or small collars. 2. Granulated cork filling in place of hair. 3. Medicament applied to cork, deer, goat or cattle Hair Pads. The company were the first manufacturers in America to make Rubber Insects and phantom Minnows, and they have met with great success in introducing these goods to the trade. They manufacture many specialties, which are well known under the name of Pflueger's Patented Anglers' supplies. They have just issued a very handsome catalogue devoted to their artificial fish baits, covering both luminous and non-luminous goods, and embracing Trolling Spoons, American Spinners, hard and soft rubber and phantom Minnows, Frogs, Crawfish, Grasshoppers, Dobsons, Insects, and every variety and pattern of bass, salmon and trout Flies, together with Line-Spreaders, Minnow Gangs, Hooks to gut and gimp, furnished Lines, Floats, Sinkers, &c. The catalogue comprises 44 pages and is finely illustrated. A supplement is in course of preparation to cover recent improvements and additions to this large list of goods.

German Competition in England.

English manufacturers of Hardware and Metal Goods generally are complaining of increased competition with Germany. The extent to which this competition has interfered with their trade in foreign markets has frequently been alluded to, but recently the English manufacturers have been more seriously embarrassed by the placing of German goods in their home markets. For some time past the Wire manufacturers of England have suffered severely, and while the German Wire is referred to as less even in gauge and in other respects less satisfactory, it is offered at so much lower a price that considerable quantities have been sold both in England and to the Colonial trade. Until a comparatively recent time a combination existed in Germany between the manufacturers which prevented them from pursuing an aggressive policy, but this combination was dissolved some time ago, and the Wire is finding its way in considerable quantities into the English markets. It is reported that German Wire has been offered in Birmingham at figures which are 15 per cent. below the ruling prices. Referring to this condition of things the *Ironmonger* remarks:

Naturally enough the Wire-drawers of the Midlands are greatly dissatisfied at this state of affairs, but we are sorry to say we do not gather from our correspondent's remarks that they are making vigorous efforts to oust their foreign competitors from the market. We are convinced that this is quite within the bounds of possibility, if our manufacturers only go into the question with an intention to win. No doubt the Germans have a little advantage in labor, but they are clearly at a marked disadvantage in point of carriage and freight, even

allowing for the fact that they get very thorough low rates from the railway companies. Where they excel, probably, is in their manufacturing processes, and it is there that we ought to be able to beat them handsomely. We hope, therefore, that some of our Wire manufacturers will investigate the reasons for the German successes, and then reform their own methods of production with the earnest resolution to run the foreigners out of our own market—to say the least.

The same journal refers to German competition in Hollow-Ware, remarking that in this branch of business the English manufacturers appear to have arrived at the conclusion that their Continental rivals had somehow or other got ahead of them, and then adds:

Having made this self-condemnatory admission, our manufacturers set about the discovery of an adequate remedy. Like the traditional drunkard, they "took a hair of the dog that bit them," or, in other words, resorted to the means by the use of which their competitors had stolen a march upon them. They went into the matter with most commendable vigor, engaged Continental chemists, adopted Continental processes, introduced Continental fine gauges of iron or steel, and spent money freely in their determination not to be beaten. In the result all this expenditure of time, trouble and money is beginning to produce its legitimate effect. The evil results of some years of lethargy and over-confidence cannot be overcome all at once, but the foreign competition is being fairly met at home and abroad, and there are plenty of indications that at no distant date continued perseverance and enterprise will give us the reversion of the markets which we ought never to have lost. We congratulate the Wolverhampton enamellers upon their pluck and fighting qualities. We hope they will "go on and prosper," and we heartily commend their spirited example to the Wire and all other manufacturers who are affected by the bugbear of foreign competition. If they resolutely resolve to beat their rivals they also can do so with certainty and ultimate considerable profits.

Method of Displaying Cutlery.

A representative of one of the leading papers of Chicago recently interviewed a State street cutlery dealer and learned a great many things relative to the variety of pocket knives occasionally carried in stock. In the course of conversation the dealer said: "You see this show case. Well, in this case I have 1300 styles of knives." "You don't mean 1300 patterns, but 1300 styles, counting variations in sizes?" said the reporter. "Yes, but I have at least 800 patterns. See that ball outside," he added, pointing to a ball about a foot in diameter hanging in a glass case in front of the store. "In that ball there are 300 knives, no two alike. By the way, that ball was the best investment I ever made. I wanted something to stick knives in, and I asked several workmen to get me up a ball like that. I had a good deal of difficulty in getting a man to take hold. Finally I found one who would make it, and he said there was only one way in which it could be done, and that was to make a ball as nearly round as possible, and then cut and miter and fit small pieces of cork and glue them to the surface. He was several days at the job, and when he had finished I had a perfectly round ball with a soft surface to stick knife blades in, and a bill of \$90 to pay. But that ball has increased my trade at least 25 per cent."

Imports of Hardware, &c.

Barbour Bros. & Co., Mach'y, cs., 9.
Baker, Hermann & Co., Arms, cs., 10; Mds., cs., 18.
Corbiere, Fellows & Co., Mach'y, pkgs., 22.
Eastwood Wire Mfg. Co., cs., 9.
Frasse, P. A. & Co., Mds., cs., 8.
Field, Alfred & Co., Mds., cs., 20.
Graef Cutlery Co., Cutlery, cs., 6; Hdw., cs., 1.
Groendyke, Jas., Arms, cs., 8.
Henderson Bros., Nails, cs., 115.
Kastor, A. d., Mds., cs., 9.
Newton & Shipman, Files, cs., 3.
Rosenfeld & Jones, Iron Machines, cs., 2.
Roessler & Haslachner, Mach'y, pkgs., 8.
Schoverling, A., Arms, cs., 7.
Schoverling, Daly & Gales, Mds., cs., 10.
Sundheimer Bros., Mach'y, cs., 2.
Thompson, Lucas & Co., Mach'y, cs., 18.
Thyssen Peter, Machine Parts, pkgs., 29.
Thompson & Co., Mach'y, cs., 13.

St. Louis as a Hardware Center.

St. Louis has many advantages as a point of distribution in a commercial sense, and in no particular line is it more prominent than in the Hardware trade. Its location is especially favorable. Situated on the Mississippi River, the city occupies a very desirable position for the handling of the trade of the Mississippi Valley, and has waterways to the North, South and West. The Mississippi River gives it a competitive rate to St. Paul and Minneapolis, equal to Chicago, and an opening to the great Northwest. Railroad facilities are of the highest order. The freight rate to Kansas City and Omaha is 95 per cent. of the Chicago rate, and the transcontinental rate, which went into effect January 1st, 1889, gives St. Louis a rate 95 per cent. of Chicago, and Chicago 90 per cent. of New York. The rapid development of the Mississippi Valley tends to greatly enhance the value of St. Louis as a distributing center, and her unrivaled position for handling the large and increasing trade of the South and Southwest leaves her without a rival in that section.

The Jobbing Trade.

The regular Hardware jobbing trade is divided among six houses—namely, A. F. Shapleigh Hardware Company, Caruth & Byrnes Hardware Company, Hilger Hardware Company, St. Louis Hardware and Cutlery Company, Witte Hardware Company and Simmons Hardware Company.

These are strictly jobbing houses. They carry full lines of Hardware and such desirable specialties as may appear from time to time on the market.

A. F. Shapleigh Hardware Company is the oldest Hardware house west of the Mississippi River, having been founded in 1843. They confine themselves almost exclusively to Hardware, and claim to have the finest and best assorted stock of Shelf Hardware in the West. They have an excellent reputation for low prices and fair dealing, the result of which is that their mail order trade is very large. They carry a large and varied assortment of General Hardware on the quality of which they lay emphasis. They are sole proprietors of the well-known brand of Diamond Edge Axes and Edged Tools, and they inform us they have a large and increasing trade for the goods. They handle large quantities of Witherby's Chisels and Drawing Knives, Ohio Tool Company's Bench and Fancy Planes. They carry a full stock of Nicholson's and Diamond Edge Files, and are agents for a complete line of Russell & Erwin Mfg. Company's Locks and Bronze Goods. They are also St. Louis agents for Reading Hardware Company's Japanned, American Bronzed and Geneva Bronzed Goods. They carry a full line of the Lanes, Laurence and Kidder Barn Door Hangers and Track; Stanley Works' line of Butts; Wm. Wilcox Mfg. Company's, Yale & Towne Mfg. Company's and Miller Lock Company's Padlocks; Eagle Lock Company's full line of Cabinet Locks; Russell & Erwin Mfg. Company's Screws of all kinds; Henry Seymour Cutlery Company's and Diamond Edge Shears, and Burgen & Balls' and Wood & Payne's Sheep Shears are always in stock. Their

assortment of Pocket Knives and Cutlery is exceptionally large, and comprises the best patterns of Rodgers' and Wostenholm's make, and also a large line of cheaper imported grades, together with a full stock of American goods. They have a complete line of Chas. Parker Co.'s and Enterprise Mfg. Company's Coffee Mills, Hale's, Peck, Stow & Wilcox Company's and Enterprise Mfg. Company's Meat Cutters; Lawrence Curry Comb Company's, W. E. T. Fitch's and W. P. Kellogg's Curry Combs, and the best makes of Horse, Shoe and Scrubbing Brushes. Their line of Novelty, Universal and Eureka Clothes Wringers is very complete. They are sole agents in the Southwest for the United States Oil and Gas Stove Company's Grand Oil Heater, and Cook Stoves. They carry a complete line of John Chatillon's Sons Spring Balances and Butcher Scales and Enterprise Mfg. Company's Sad Irons, and are agents for the well-known Centennial Refrigerators, and also Boys' Wagons and Sleds of all kinds. They have in stock a large supply of R. E. Deitz's well-known Tubular Lanterns and Street Lamps, and a large variety of other makes. Their stock of Brass Fire Sets, and Irons and Fenders is also large and varied. They handle the Northwestern, Globe, Putnam, Triumph, and Mound City Horse Nails and Burden's Horse and Mule Shoes. Their Saddlery Hardware Department comprises Horse Collars of all varieties, Rein Snaps, Bands, Traces, Butts, Spurs, &c. They deal largely in Ames', Rowland's Chisholm's and other lines of Shovels and Scoops, and are city agents for the well-known Iowa Farming Tool Company's line of Agricultural Tools. They also carry a full line of the "Prize" and other Grain Cradles, and Wadsworth's Scythes, Philadelphia and other Lawn Mowers, all kinds of Garden and Railroad Barrows, Cyclone Churns, Vaughn's Post Hole Auger and Eureka Diggers. Henry Distons & Sons' Hand and Cross-Cut Saws, E. C. Atkins & Co.'s Cross-Cut Saws, Stanley Rule and Level Company's Carpenters' Tools, Rules, &c., Acme Skates and Union Hardware Company's Skates. They deal extensively in Wheeling Steel Nails, and Standard Wire Nails, and are city agents for Freeman Wire Company's product. They are represented by a corps of efficient salesmen in every State and Territory from Minnesota to the Gulf and from Indiana to the Pacific Coast up into British Columbia.

Caruth & Byrnes Hardware Company carry a full line of General Hardware and deal largely in Geneva Tool Company's Forks, Handled Planters' and Cotton Hoes, Lane and Yale's, Scovill's and Sandusky Tool Company's Planters' Eye Hoes, Seymour Mfg. Company's Cradles and Snaths, Auburn Mfg. Company's Grain and Grass Scythes, Philadelphia Lawn Mowers, Lawrence Curry Comb Company's and W. P. Kellogg's Curry Combs and Hunt's Axes and Edge Tools. They have a large trade in their own "Extra" brand of Clipper Axes and Hatchets and Powell Tool Company's Canada and Western pattern Broad Axes. They carry a large stock of Wagon, Trace and Coil Chains, one and two loop Hames, Wagon and Single Trees; also, Newhouse and Hawley & Norton's Game Traps. Their stock is well kept up in Scale Beams, Burden's Horse and Mule Shoes, Steel and Wire Nails, Sweet's Mfg. Company's Toe Calks, Northwestern, Essex and Anchor Horse Shoe Nails. Also, a full line of New American File Company's, Nicholson File Company's and Henry Distons & Sons' Files, Fayette R. Plumb's and D. Maydole & Co.'s Hammers, H. Diston & Son's Saws, Ohio Tool Company's and Bailey's and Stanley Rule and Level Company's Planes, United States Screw Company's Screws, Charles Parker Company's Coffee Mills, Brauford Lock Company's Locks

and Knobs, and Mallory-Wheeler Company's Padlocks. They carry a very complete line of Barney & Berry Skates, St. Louis Stamping Company's Granite and Stamped Ware, and Novelty and Eureka Clothes Wringers, and in addition have a complete line of Sargent's Shelf Hardware, Rogers', Wostenholm's and best brands of American, English and German Pocket Knives, Razors, &c., Bridgeport Knife Company's Table Cutlery, English and Belgium Double-Barrel Muzzle and Breech Loading Shot Guns, and a complete assortment of Sporting Goods. They are St. Louis agents for Cambria Iron Company's patent Link Barbed Fence Wire.

Hilger Hardware Company was established in 1866, and have a large trade in general Hardware. They carry an extensive line of H. Distons & Sons', Saws, Nicholson's and Smith's Files, Branford Locks and Knobs, and Hunt's and Lippincott's Axes. They have an extensive trade in the Daisy brand of Axes, which is manufactured especially for them. Their line of Peck, Stow & Wilcox Company's Goods is particularly complete, and they also deal largely in Russell & Erwin Mfg. Company's Screws. They find a large market for the special brands of Leader Shovels, Hatchets, &c., which they handle. They inform us that their trade has increased largely during the past year, and prospects for the coming year are particularly encouraging.

St. Louis Hardware and Cutlery Company, is, comparatively speaking, a young house, but in the short time they have been in business they have built up a large and desirable trade, which speaks well for the industry and enterprise of those connected with the concern. They carry a full line of Shelf Hardware, and all the standard makes of Saws, Files, Locks and Knobs, Hinges, Hangers, Screws, Axes and Hatchets, &c. They make a specialty of Cutlery and have an exceptionally fine assortment of the same, both imported and domestic, and make a point of handling only first-class goods.

Witte Hardware Company was organized in 1880 and succeeded F. A. Witte & Co., whose business dates back to 1849, at which time they conducted a retail store. Gradually their business grew with the city and its increasing trade until they reached their present position. Their new catalogue, which has just been issued, and which is to a great extent in the hands of their customers, is a work that was favorably commented on in these columns not long since, and they are daily in receipt of letters from their customers speaking of it in high praise. The book is divided into seven distinct departments, and comprises every article handled by a first-class jobbing house, the most prominent manufacturers being represented therein. They have a large number of reliable and well-posted traveling men in Illinois, Missouri, Kansas, Arkansas, Nebraska, Kentucky, Tennessee, Colorado and Texas. They invite dealers who have not been customers to send them a trial order, which will secure them a copy of the catalogue above mentioned.

Simmons Hardware Company, Incorporated, have a capital of \$1,000,000, with a surplus of \$250,000. This company occupy three connected buildings on Washington avenue, two five and one six stories. They have a frontage of 200 feet and a depth of 150 feet, and extend 10 feet under the sidewalk on three sides. They have also a six-story warehouse one block distant from main stores, 68 x 102 feet, with steam connection between them. In addition to the above, they have a one-story warehouse for Nails, Horseshoes, &c., 75 x 150 feet, with printing department and carpenter shop attached. The superficial area is 252,302 square feet.

They have on their roll 89 salesmen, and cover all States and Territories with the exception of Pennsylvania and the States north and east of it, and Delaware, Virginia, North and South Carolina. They issue one of the most complete catalogues in the trade, 8000 volumes of the last edition being printed and distributed, each volume containing 1636 pages and 7138 illustrations. Their first catalogue of these dimensions was issued in 1879. Since then they have placed two others in the hands of the trade, one in 1883 and the other in 1886. These volumes were so comprehensive and the undertaking of such magnitude that the impression prevailed that the manufacturers whose goods were represented largely contributed toward the expense of getting them up. This is true in a small degree, as referring to their first catalogue. Many manufacturers then volunteered to bear part of the expense, regarding the matter in the light of an advertisement. The total amount received from this source was scarcely one-tenth of the cost of this issue. In the two other catalogues the firm refused to accept any contributions from the manufacturers, believing the principle wrong and antagonistic to independent buying. They carry a very extensive and complete stock in Hardware and Cutlery, Stamped Ware, House-Furnishing Goods, &c. In these lines are embraced such standard makes as H. Disston & Sons' Saws, Files, &c., Oliver Ames & Sons' and Wm. Chisholm & Sons' Shovels and Spades, Douglass Axe Company's Axes, Tools, &c., Hubbard & Co.'s Axes, Hoes, &c., Enterprise Mfg. Company's Specialties, Eagle Lock Company's Locks, &c., Norwalk Lock Company's Japanned and Bronze Locks, Russell & Erwin Mfg. Company's Bronze Locks, Yale & Towne Mfg. Company's Locks, Niles Patent Locks, Fayette R. Plumb's Hammers, Geo. Wostenholm's Pocket Knives and all standard brands of American Pocket and Table Cutlery. Among the articles they control are the following: Lightning Nail Pullers, Climax Farming Tools, Sublett's Eye and Handle Hoes, Keen Clipper Lawn Mowers, Maynard's Shovels and Spades, Corey's Axle Pulleys, Perfection Gasoline Stoves, Siberia Refrigerators and the well-known "Keen Kutter" Axes, Hatchets, Adzes, Mattocks, Picks, Augers, Bits, Files, Chisels, Draw Knives, Plane Irons, Saws, Cutlery, Scythes, Brush Hooks, Hay Knives and Sheep Shears. This house has practically no season, the area covered being so large. Commencing at the Gulf of Mexico or California, they follow up the season to Minnesota, Dakota, &c. They are large buyers, and often purchase the entire product of a manufacturer, which gives them decided advantages as regards prices over some of their competitors, whose capital will not allow them to operate quite so extensively. The perfection of the business system of this house, as well as the ability and enterprise of its management, is generally acknowledged, its position being conceded as one of the most extensive, complete and well directed mercantile establishments in the country.

Make the Store Attractive.

The wide-awake merchant will keep his store as attractive as the nature of his business or the surrounding circumstances will allow; his stock will be displayed to the very best advantage, and will at all times be as fresh and new as possible. He will also see that a portion of his stock is not here one day and there next, and thus causing the waste of precious time in locating a certain article, for which a customer has to make inquiry. There will be a place for everything and everything will be in its place. The counters, too, will be varnished and kept well dusted.

A few revolving seats, ranged alongside each counter, will add both to the appearance of the store and the comfort of the customers. The man who is alive to the interests of his business, says a writer in a recent issue of the *Grocers' and Cannery's Gazette*, will also be extremely particular about the way in which his window is dressed. In whatever line of goods the live man deals, he will see to it that his shop front is dressed to the best advantage. He will also see that there is no laxity of "elbow grease" on the part of him whose duty it is to polish the windows in the store front. Also that every employee, as well as the proprietor, presents a clean and respectable appearance, and that everything resembling either loudness in dress, or vulgarity in speech or demeanor, is strictly eschewed.

Banquet to James M. Horton.

The wholesale Hardware house of Horton, Gilmore, McWilliams & Co., successors to William Blair & Co., Chicago, closed the first year of their existence on the 31st ult. To fittingly commemorate the event, and, at the same time, to show their appreciation of the many excellent qualities of their chief, the salesmen and clerks concluded to give a banquet in honor of James M. Horton, president of the company. It came off at the Grand Pacific Hotel on the evening of the 2d inst. The arrangements were perfected by a committee composed of John R. Black, chairman; Walter G. Barker, Robert H. Nott, Fred. V. Chislett and Geo. C. Noyes, who performed their duties to the entire satisfaction of their business associates and invited guests. Some 75 gentlemen participated in the banquet, but that number by no means embraces the whole of the employees, as a number of them were unable to be present. The tables were arranged in the form of a horseshoe, and were beautifully decorated with flowers, ferns and smilax. The trade-marks of the firm, "Black Diamond" and "Our Mascotte," in appropriate floral settings, occupied a conspicuous position. The menu, which was quite elaborate, was printed in book form, bound in heavy white beveled-edged cardboard, fastened with pink ribbon. While the various courses were being served an orchestra discoursed choice musical selections. No wines were served at this banquet. The post-prandial exercises were opened by Chairman Black, who congratulated his associates upon the very satisfactory manner in which the details of the banquet had been arranged, and called upon Robert H. Nott, as the oldest salesman connected with the house, to elucidate the purpose of the gathering. In a very felicitous speech Mr. Nott voiced the sentiment of the employees of the company toward Mr. Horton, assuring him of their high appreciation of his un-failing courtesy, uniform good temper and thorough fairness toward all of them. He closed with the presentation of an enormous bouquet of the choicest flowers. Mr. Horton responded with evident emotion, but soon regained control of his feelings, and in a speech of considerable length and remarkable power thanked his employees for their kindly manifestations of regard and even affection. He expressed his earnest appreciation of the efforts which all of them had made during the year to push forward the business of the house, dwelt upon the relations which should exist between employer and employed, referred to his own experience in business in working up from an apprenticeship to the head of a great firm, and urged his hearers to remember and apply in the discharge of their duties the Golden Rule, to do unto others as they would have done unto themselves. He alluded to the co-operation of his associates in the company, paid a graceful

tribute to the old house of William Blair & Co., from whom the new house had sprung, like Minerva from the brain of Jupiter, full grown, and called upon his employees to take for their motto "Whatsoever man hath done in this line we will do," closing his speech with an acknowledgment of the favor and the overruling power of Providence, without whose aid no earthly good can be accomplished. David McWilliams, treasurer of the company, was called upon and made a most pleasing impression by his well-chosen remarks. He referred to the fact that although he was an old resident of Illinois his connection with this company was his first venture in business in Chicago. He predicted a period of general prosperity for the business interests of the country this year, based largely on the excellent condition of the agricultural community. Messrs. F. V. Chislett, Joseph Brown, Walter G. Barker, M. M. Levison, Rose, Berry, Gilmore, Noyes, Gregory, Klobber, Higgins, Fuller and a large number of others made short addresses. A quartette composed of employees favored the company with a song. At a late hour the assemblage dispersed, feeling, in the words of one of their number, that the banquet had certainly been "net list—no discount."

Exports.

PER BRIG ALICE, DEC. 26, 1888, FOR PORT NATAL, SOUTH AFRICA.

By H. W. Peabody & Co.—10 cases Edge Tools.
By Leaycraft & Co.—1 Stove, 10 Ranges.
By Marcial & Co.—6 cases Carriage Ware, 14 Pumps.
By R. W. Forbes & Son.—2 dozen Clocks.
By M. Berliner.—5 packages Carriage Ware, 36 pieces Stoves.
By W. H. Crossman & Bro.—48 dozen Hatchets, 3750 pounds Sash Weights, 235 pounds Sash Cord, 21½ dozen Washstands, ½ dozen Corn Shellers, 3 dozen Washboards, 9 dozen Pails, 2 cases Carpenters' Tools, 12 dozen Wrenches, 5 cases Hardware, 3 Oil Stoves, 7 cases Hardware, 1 case Carpenters' Tools.

PER BARK CECILE, DEC. 31, 1888, FOR PORT NATAL, SOUTH AFRICA.

By Corner Bros. & Co.—3 cases Machinery, 2 cases Agricultural Implements, 189 cases Agricultural Implements, 1 case Hardware.
By H. W. Peabody & Co.—3 cases Lampware, 4 cases Carriage-ware, 8 cases Hardware, 2 packages Lampware, 13 cases Agricultural Implements, 46 cases Hardware.
By W. H. Crossman & Bro.—¼ dozen Hoes, 9-12 dozen Shellers, 1½ dozen Stuffers, 96 Plows, 2½ dozen Plows, 2 dozen Store Trucks, 104 Plows.

Mayor Grant, of New York, speaks in his message of another measure of still greater consequence as affecting the interests of this city when he says: "It is now generally conceded that in order to make provisions for our commerce it is essential that the city acquire title to all the water front. The rights of private owners should, therefore, be acquired with as little delay as practicable. The attainment of this object is greatly simplified by a recent decision of the Court of Appeals."

The official inspector of the work on the new aqueduct startled the Fasset Senate investigating committee on Monday by stating that there were hundreds of places where the masonry was only one brick thick and in scores of places the backing consisted only of empty barrels. The sum of \$1,000,000 will be required to make good the defects.

Mayor Chapin, of Brooklyn, says in his message to the Board of Aldermen that in all plans for the future it is proper to bear in mind the probable early need of using the city's credit to pay for its part of the construction of a second East River bridge.

A bridge, to cost \$750,000, across the Allegheny River, is proposed by the Pennsylvania Railroad Company, to avoid hauling freight trains through the city.

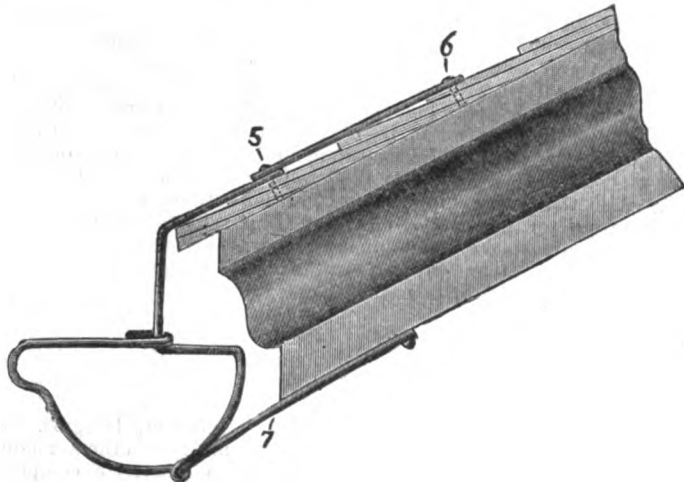
Economy Eave-Trough Hanger.

By means of the engravings shown herewith, we are enabled to present for the consideration of our readers some

struction, and is stated to give very satisfactory results in operation.

The same company are also introducing to the trade a very simple device for fastening conductor-pipe in place. This

inserted a nail or other suitable tool for twisting the wire and drawing it firmly about the conductor-pipe. When the operation is completed, the pipe fastener presents the appearance represented in the lower part of Fig. 3. This is a very simple means of holding conductor-pipe in place, and possesses the merit of being quickly applied.



Economy Eave Trough Hanger.—Fig. 1.—Showing Manner of Attaching Hanger to Roof.

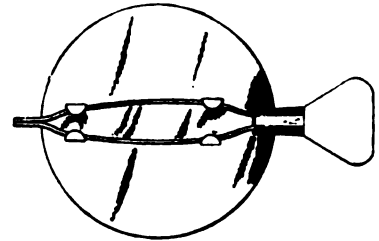
views of the Economy Eave-Trough Hanger, manufactured by the Freeport Hardware Mfg. Company, of Freeport, Ill. In Fig. 1 is shown a general view of the hanger as it appears in position to receive the eave-trough, while Fig. 2 shows the trough placed in the hanger. In putting the device in position, the first step is to wind the wire hanger around the trough, making a connection by means of the hook above the middle of the trough. Then the rod is straightened up from this point, and bent over on to the roof to accommodate the fall of the trough. A nail is driven as near to the edge of the shingles as the cornice will permit, and then the wire is wound once around the nail at 5 in the engravings. The operation is completed by driving another nail in the eye at 6. The manufacturers state that troughs put up in this manner will remain firmly in place, because the wire clinches the trough tightly and runs up perpendicular from the middle of it to the edge of the roof, making it impossible for the trough to hang crooked. An additional means of keeping the trough rigid is provided in the shape of a lower brace, shown at 7 in the engravings, which is fastened to the cornice by means of the eye shown in Fig. 1. It is obvious, however, from an inspection of this construction that the form of hanger here employed is practically limited to the general style of cornice indicated in Fig. 1 of the illustrations. These hangers are made of galvanized wire, and, therefore, will not rust.

consists of a piece of bent wire in the form of a circle, one of the articles being shown suspended from a nail in Fig. 3

to the trade a form of stamped damper for smoke and hot-air pipes, which is claimed to possess many interesting features. This damper, a general view of which is shown

Baile's Improved Damper.

Robert Baile, of 749 South Nineteenth street, Philadelphia, is introducing



Baile's Improved Damper.

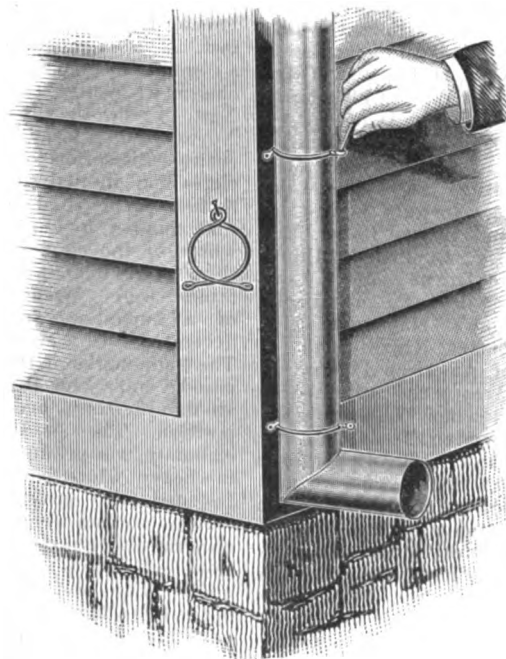


Fig. 3.—Method of Using Conductor Pipe Fastener.

of the accompanying illustrations. The piece of wire is slipped around the con-

in the accompanying illustration, is made in one piece, and the stamping, crimping and the forming of the four lugs designed to hold the handle in place are performed by one operation. The handle is made of wire with a tapering shank, which is designed to hold the handle in any desired position. There are no nuts or threads employed in the construction of the device, and it is claimed to be simple and durable. It is easily placed in position in the pipe and is convenient to operate. The manufacturer claims that this damper can be made at a much reduced price, as compared with other devices intended for the same purpose, and that it possesses the merit of being light and efficient.

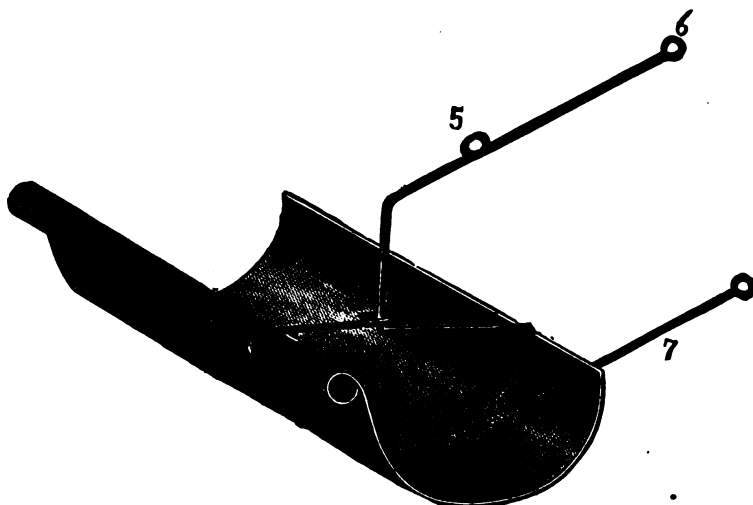


Fig. 2.—Eave Trough Placed in Hanger.

The only tools needed in putting up the Economy eave-trough Hanger are a hammer and a few nails. It is simple of con-

ductor-pipe and nailed to the building by means of the two eyes, clearly indicated in the cut. In the eye in front of the pipe is

The Electric street railway, to be built in Fulton street, New York, is progressing slowly. The street is broken and the details of construction are lying around in great confusion. The delay is probably caused by the proverbial wire pulling with which New Yorkers are so well acquainted.

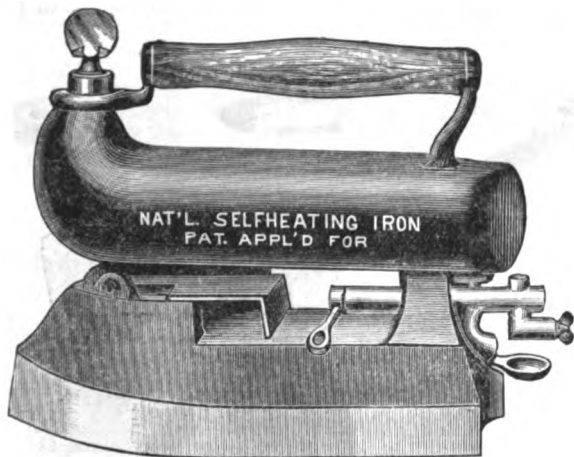
John W. Wagner, of Mansfield, Ohio, announces that he has associated his son in business with him, the firm hereafter to be Wagner & Son.

National Self-Heating Sad Iron.

The illustration given below represents a sad iron as now made by the National Self-Heating Sad Iron Company, 109 N. Sixth street, St. Louis, Mo. The gasoline is contained in a tank below the handle which is filled by removing brass screw

from the fact that its diameter is 5 inches. It is pointed out that it can often be used in place of a colander, coarse strainer, ladle, spoon, &c., thus saving time and labor in handling and washing different utensils. It is made in two patterns, one of which is shown in the cut, the other being made with a single piece of perfor-

ton, on the 16th of January, the programme including the discussion of a paper presented by W. B. Sherman at the last meeting, entitled, "What is the Safe Ratio of Pumping Capacity to Maximum Consumption?" The discussion is to be followed by a series of brief papers, to consist of a short statement of some personal experience or observations.

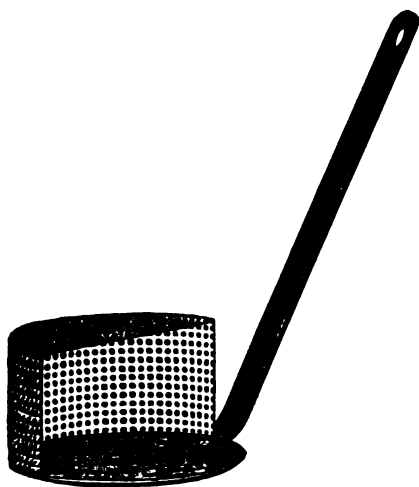


The National Self-Heating Sad Iron.

cap in front of handle. Recent improvements have been made in the burner, which, as now made, is referred to as odorless and not requiring air-pressure to force gasoline to the generator. It is stated that one filling will burn five hours. The advantages claimed are that the heat is under perfect control and can be regulated according to the material to be ironed; that it saves the fuel used in the ordinary method of heating irons and the labor involved in going from the stove to the ironing table; that one iron does the work and is continually hot; that it is simple, durable, and clean, and that the handle remains cool and requires no holder.

Perfection Skimmer.

This article, which is represented in the accompanying illustration, is put on the market by the Hamblin & Russell Mfg. Company, Worcester, Mass. From the engraving it will be seen that the skimmer has a drainer attachment by which solid



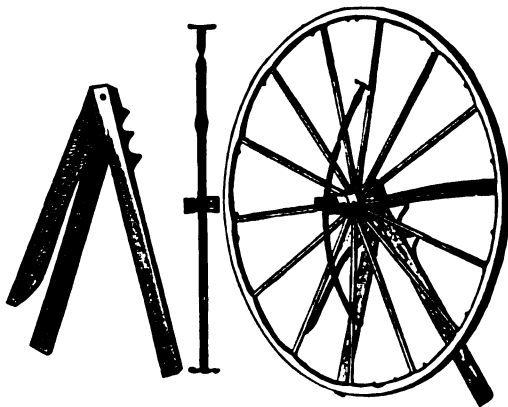
Perfection Skimmer.

substances, such as peas, beans, preserves, boiled eggs, fried potatoes, &c., can be quickly and thoroughly separated from the liquid in which they are cooked without danger of spilling them on the stove, table or floor. The size and general dimensions of the skimmer and drainer may be inferred

from the fact that its diameter is 5 inches. It is pointed out that it can often be used in place of a colander, coarse strainer, ladle, spoon, &c., thus saving time and labor in handling and washing different utensils. It is made in two patterns, one of which is shown in the cut, the other being made with a single piece of perfor-

The Daisy Wagon Wrench and Common-Sense Jack.

The accompanying illustration represents a new wagon wrench and a new jack which have just been put on the market by the patentees and manufacturers, Fred. A. Wegner & Co., 184 Lake street, Chicago. The wrench and jack are shown separately and as used in connection with a buggy or wagon wheel. The Daisy wrench is made of steel and rubber, the socket being so constructed as to fit the burr and washer. The ends are sprung into place on the spokes of the wheel, and the wheel, washer and burr then move together. If the wheel



The Daisy Wagon Wrench and Common-Sense Jack.

is revolved too rapidly and drops off the axle, the burr and washer are still held in place in the hub. It is described as exceedingly simple, doing its work perfectly, and is sold at a very low price. The ends of the wrench are covered with rubber, so that they will not scratch the spokes, making it possible to use the wrench for the finest carriages. The common-sense buggy and wagon jack is also of very simple construction, as shown in the illustration, and is also sold at a very low price.

The New England Water Works Association has issued a circular announcing that the adjourned meeting of the Association will be held at Young's Hotel, Bos-

ton, on the 16th of January, the programme including the discussion of a paper presented by W. B. Sherman at the last meeting, entitled, "What is the Safe Ratio of Pumping Capacity to Maximum Consumption?" The discussion is to be followed by a series of brief papers, to consist of a short statement of some personal experience or observations.

Improved Tubular Lantern.

In the cut presented herewith we show a general view of an improved lantern which has recently been patented by Messrs. T. Phillips & Co., of Orillia, Canada, and is being manufactured by E. T. Wright & Co., of Hamilton, Ontario. The special feature of construction to which the makers direct attention is the hinge made of brass, and so arranged that the



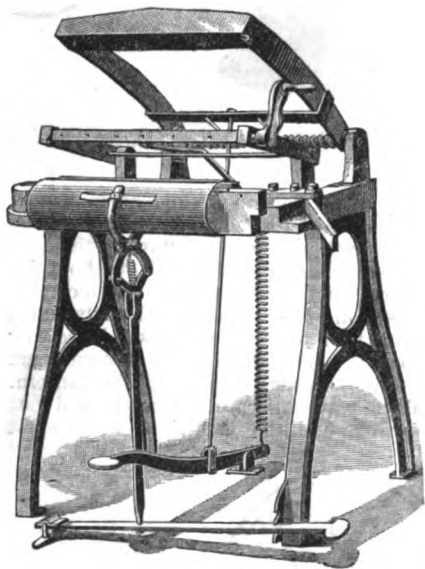
Improved Tubular Lantern.

entire upper portion of the lantern may be tilted to one side. This gives free access to the wick and burner, allowing them to be easily cleaned or replaced without interfering with the chimney. By a careful inspection of the engraving the advantage of this form of construction will be readily apparent. The top is also thrown back for the purpose of lighting the lantern. All the parts are carefully made and put together, and the makers feel confident

The Electric Street Railway, in Boston, being built under the Bentley-Knight and Sprague patents, is nearly completed. It will be ready for operation in time to test the feasibility of those systems amidst the ice and snow of the Boston climate, which is particularly bad for subways, owing to the rapid variations in temperature, which give rise to large quantities of slush and sleet, the two evils against which electric railways will have to contend.

Stove-Pipe Machine.

Messrs. William Horn & Co., Keokuk, Iowa, have brought out a stove-pipe machine, the general construction of which is indicated in the accompanying illustration. The motive power is applied by means of a foot treadle something after the style of those employed in certain forms of roofing machines. The treadle is located in front of the machine, which is designed to be placed upon the right-hand end of the work-bench, or it may be set upon legs, as most convenient. It is shown in the latter form in the cut. The clamping device is worked by means of a smaller treadle, shown just below and at right angles to the larger one, and is held in place by a series of ratchets, clearly indicated in the cut. The rivet bar and frame are suspended from the mandrel by means of balance springs, and can be brought down when needed by means of the foot treadle. This is usually done just before the drop of the hammer. The cylinder, or frame, is attached to the mandrel bar, and may be constructed of any size desired. After the stove-pipe has been cut and formed in the usual manner it is slipped over the mandrel and is then clamped up by means of the clamping device which is operated by the



Stove-Pipe Machine.

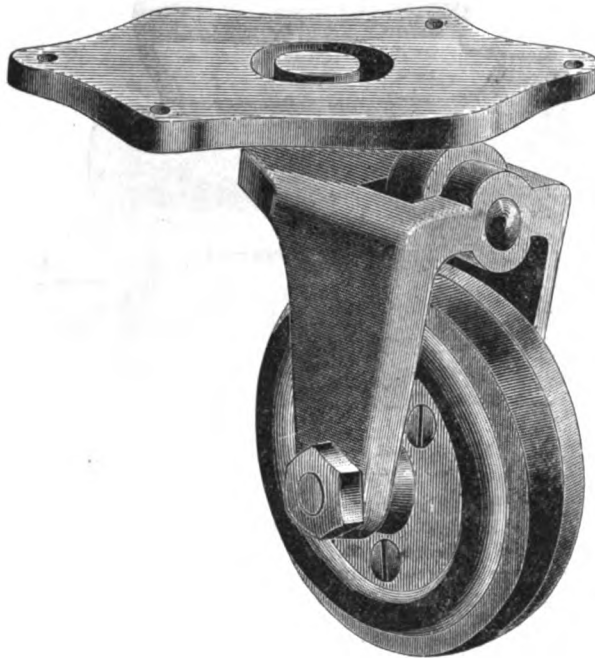
smaller foot treadle already described. The pipe is firmly held in position until the riveting is completed, when it is released and readily slips off, making every joint true to size. The hammer is raised automatically by a spring and brought down to its work by the foot treadle. It is held up by a catch or trigger when operated by foot power, but when run by steam power a friction pulley and trigger are employed. The rivet bar indicated at the front of the machine is kept in a raised position by means of a spring not shown in the cut. In operating the machine the first step is to swing out the mandrel, which is hinged at the left and secured in place by a key-plate at the right. The rivets are then put in position by the mandrel and the sheet of which the pipe is made clamped in place. The mandrel is then swung into position and secured, when the pipe is formed as described. The rivet bar, operated by a crank, is then turned and brought down upon the pipe, the holes in the bar corresponding with the rivets in the mandrel and constituting a multiplex rivet set. When in this position the hammer is brought down, drawing the rivets through the lap of the pipe. The bar is then raised to its original position, as shown in the cut, and the flat surface

brought down, when a blow of the hammer heads the rivets and completes the operation.

Clark's New Improved Anti-Friction Caster

Geo. P. Clark, Windsor Locks, Conn., manufacturer of trunk and furniture casters, has recently put on the market a new

to wheat and corn. On January 1, 1888, it had 1459 farms, and December 1 these were carrying 2051 mortgages. The assessed value of the land was \$596,542, and the face value of the mortgages was \$1,091,929. The total assessed value, undoubtedly below the true value, of the real and personal property of the county subject to taxation was, December 31, 1887, \$1,290,390, so that if the county



Clark's New Improved Anti-Friction Caster.

line, one of which is shown in the accompanying illustration, which indicates its special features. Set firmly in the frame of the caster over the wheel and under top plate is an anti-friction roller. The top plate is adjusted so that all weight may come directly on the roller, and not on the center pivot. As a result of this construction it is claimed that heavy trucks or furniture mounted on these casters move with much less friction, and can consequently be handled with less exertion than is required where ordinary casters are used. Two styles of these casters are manufactured, one being fitted with plain iron wheels and the other with the Clark noiseless rubber tired wheels, which, by the way, we are advised, have superseded iron wheels in many mills and warehouses on account of their noiselessness and the fact that they do away with the tearing and splintering of floors. While these casters are particularly well suited to mill and warehouse trucking, they are referred to as admirably adapted for all purposes for which casters are used, as on heavy show-cases, heavy refrigerators, sideboards, pianos, &c. By this addition it will be seen that Mr. Clark's exceptionally complete line of casters is further enlarged, and this new caster is regarded as meeting the requirements of the trade for such an article.

One of the trade correspondents of the *London Engineer* reports that one large furnace has been set on to make aluminium pig iron, and the product is giving great satisfaction to the stove-grate casters and others for fine ware, who require a fluid metal free from the chance of blow-holes, which this new alloy accomplishes, and it is very fine grained, so gives a beautiful polished surface.

Speaking of the burden of farm mortgages, a Western paper cites as an illustration Phelps County, in Nebraska, one of the smaller counties of the State, devoted

paid its mortgage debts in the East, four-fifths of all its land, houses, horses, cattle and live stock would go to meet the debt.

The Detachable Empire Sash Cord Fastener.

The accompanying illustration represents this article. It is manufactured by the Empire Portable Forge Company, Cohoes, N. Y. Fig. 1 shows the fastener as applied to the sash cord, and Fig. 2 represents it as attached to the window sash. It is explained that the sharp rib extending over the top of the fastener

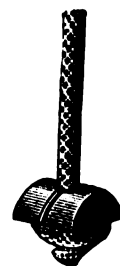


Fig. 1.

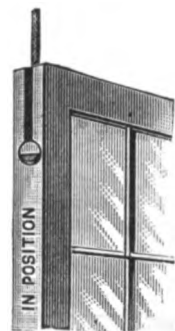


Fig. 2.

The Empire Sash Cord Fastener.

through the center is by the weight of the sash caused to sink in the frame, and is thus held firmly in place. The manufacturers allude to the following advantages in the use of this simple device: That it costs less than 1½ cents per sash; that it requires no nails or screws; that it can be put in or taken out very quickly; that it prevents the knot from fraying out and getting between the sash and the frame; that there is no liability of its splitting the sash, and that it prevents the cord from running back into the weight pocket.

CURRENT HARDWARE PRICES.

JANUARY 9, 1889.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers' name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers, at the figures named.

Ammunition.

Caps, Percussion, # 1000—	
Hicks & Goldmark's	
F. L. Waterproof, 1-10's	50¢
E. B. Trimmed Edge, 1-10's	25¢
E. B. Grnd. Edge, Cent. Fire	25¢
1-10's, 70's	74¢
Double Waterproof, 1-10's	\$1.40
Musket Waterproof, 1-10's	50¢
G. D.	30¢
S. B.	30¢
Union Metallic Cartridge Co.	
F. L. Trimmed	50¢
F. L. Ground	65¢
Cent. Fire Ground	70¢
Dbl. Waterproof	\$1.40
Dbl. Waterproof, in 1-10's	\$1.40
S. B. Genuine Imp.orted	45¢
Eley's E. B.	54¢
Eley's D Waterproof, Central Fire	\$1.60
Cartridges	
Rim Fire Cartridges	50¢
Rim Fire Military	15¢
Cent. Fire, Pistol and Rifle	25¢
Cent. Fire, Military and Sporting	15¢
Blank Cartridges, except 22 and 32 cal.	15¢
Blank Cartridges, 22 cal.	\$1.75
Blank Cartridges, 32 cal.	\$3.50
Primed Shells and Bullets	15¢
B. B. Caps, Round Ball	\$1.75
B. B. Caps, Con. Ball, Swgd.	\$3.00
Primers	
Berdan Primers	\$1.00
R. L. Caps (for Sturtevant Shells)	\$1.00
All other Primers	\$1.20
Shells	
First quality, 4, 8, 10 and 12 gauge	85¢
First quality, 14, 16 and 20 gauge	\$1.00
Star, Club, Rival and Climax brands	35¢
10 and 12 gauge	35¢
Club, Rival and Climax brands, 14, 16 and 20 gauge	35¢
Seibold's Comb. Shot Shells	60¢
Brass Shot Shells, 1st quality	60¢
Brass Shot Shells, Club, Rival, Climax	65¢
I. X. L. 10 and 12 gauge	40¢
"Special," 16 gauge	30¢
"Special," 10 and 12 gauge	40¢
Fowler's Pat.	\$3.25
Shells Loaded	
A. M. C. List No. 19, 1887	20¢
A. M. C. List, December, 1888	40¢
Wads	
U. M. C. & W. R. A.—B. E., 11 up	\$2.00
U. M. C. & W. R. A.—B. E., 9½ up	2.30
U. M. C. & W. R. A.—B. E., 7½ up	2.60
U. M. C. & W. R. A.—P. E., 11 up	3.10
U. M. C. & W. R. A.—P. E., 9½ up	4.00
U. M. C. & W. R. A.—P. E., 7½ up	4.90
Eley's B. E., 11 up	\$1.75
Eley's P. E., 11 up	\$1.75

Anvils	
Eagle Anvil	\$104, dis 20¢
Peter Wright's	94¢
Armstrong's Mouse Hole	84¢
Armstrong's Mouse Hole, Extra	111¢
Trouton	94¢
Wilkinson's	94¢
J. & Riley Carr, Pat. Solid	111¢
Anvil Vice and Drill	
Millers Falls Co.	\$18.00, dis 20¢
Cheeny Anvil and Vice	85¢
Allen Combined Anvil and Vice	\$3.00
Moore & Barnes Mfg. Co.	35¢
Apple Parers	
Advance	¢ dos \$4.75
Antrim Combination	¢ dos 5.50
Baldwin	¢ dos 5.25
Champion	¢ dos 7.25
Eureka, 1888	each 17.00
Family Bay State	¢ dos 12.00
Gem	¢ dos 5.25
Gold Medal	¢ dos 4.00
Hudson's New '88	¢ dos 3.75
Ideal	¢ dos 4.75
Improved Bay State	¢ dos 3.00
Little Star	¢ dos 5.00
Monarch	¢ dos 13.50
New Lightning	¢ dos 5.50
Oriole	¢ dos 4.00
Penn.	¢ dos 4.00
Perfection	¢ dos 4.00
Pomona	¢ dos 6.00
Rocking Table	¢ dos 6.00
Turntable	¢ dos 4.50
Victor	¢ dos 13.50
Waverly	¢ dos 4.50
White Mountain	¢ dos 4.50
72	¢ dos 4.25
75	¢ dos 5.75
78	¢ dos 6.50

Augers and Bits	
Douglas Mfg. Co.	
Wm. A. Ives & Co.	70%
Humphreysville Mfg. Co.	
French, Swift & Co. (F. H. Beecher)	55%
Cook's, Douglas Mfg. Co.	55%
Cook's, N. H. Copper Co.	50¢
Ives' Circular Lip	60%
Patent Solid Head	30%
C. E. Jennings & Co., No. 10, extension	40%
Id.	40%
C. E. Jennings & Co., No. 30	60%
C. E. Jennings & Co., Auger Bits	60%
35¢ quarter, No. 5, 8; No. 30, \$3. dis 20%	
Low's Patent Single Twist	45%
Jennings' Augers and Bits	25%
Imitation Jennings' Bits	60¢
Pugh's Black	30%
Car Bits	50¢
L'Hommiedes Car Bits	15¢
Forester Pat. Auger Bits	10%

Hollow Augers

Ives' No. 4, 7 dos \$30	dis 40%
Swan's	40%
Steer's, No. 1, 2; No. 2, 22	dis 35%
Steer's No. 2, 44	dis 20%
Common	¢ gross \$2.75
Diamond	¢ dos \$1.10
"See"	25¢
Double Cut, Sheppardson's	45¢
Double Cut, Ct. Valley Mfg. Co.	40¢
Double Cut, Hartwell's, 7 gro.	\$5.25
Double Cut, Douglass	40¢
Double Cut, Ives	60¢

Expansive Bits	
Clark's small, 18; large, 22	dis 35¢
Ives' No. 4, 7 dos \$30	dis 40%
Swan's	40%
Steer's, No. 1, 2; No. 2, 22	dis 35%
Steer's No. 2, 44	dis 20%

Gimlet Bits	
Common	¢ gross \$2.75
Diamond	¢ dos \$1.10
"See"	25¢
Double Cut, Sheppardson's	45¢
Double Cut, Ct. Valley Mfg. Co.	40¢
Double Cut, Hartwell's, 7 gro.	\$5.25
Double Cut, Douglass	40¢
Double Cut, Ives	60¢

Bit Stock Drills	
Morse Twist Drills	50¢
Standard	50¢
Cleveland	50¢
Syracuse, for metal	50¢
Syracuse, for wood (wood list)	30¢
Williams' or Holt's, for metal	50¢
Williams' or Holt's, for wood	40¢

Ship Augers and Bits	
L'Hommiedes	15¢
Watrous	15¢
Snell's	15¢
Snell's Ship Auger Pat.	15¢

Awl Hafts	
Sewing, Brass Ferrule	\$3.50
Pat. Sewing, Short	\$1.00
Pat. Sewing, Long	\$1.20
Pat. Peg, Plain Top	\$1.00
Pat. Peg, Leather Top	\$1.20

Awls, Brad Sets, &c	
Awls, Sewing, Common	¢ gr \$1.70
Awls, Shouldered Peg	¢ gr \$3.45
Awls, Pat. Peg	¢ gr 63¢
Awls, Shouldered Brad	¢ gr 70¢
Awls, Handled Brad	¢ gr 70¢
Awls, Handled Scratch	¢ gr 70¢
Awls, Socket Scratch	¢ gr 70¢

Awl and Tool Sets	
Alken's Sets, Awls and Tools, No. 20	¢ dos \$10.00
Fray's Adj. Tool Hds.	¢ dos \$1.10
Miller's Falls Adj. Tool Hds.	¢ dos \$1.10
Henry's Combination Haft	¢ dos \$1.10
Brad Sets, No. 42, \$10.50; No. 43, \$12.50	
Brad Sets, Stanley's Excelsior, No. 1	\$7.50
Brad Sets, Stanley's Excelsior, No. 2	\$4.00
Brad Sets, Stanley's Excelsior, No. 3	\$5.50

Axes	
Makers' and Special Brands	
First quality	¢ dos \$4.00
Others	¢ dos \$5.50
Axle Grease	
Fraser's, in bulk	Keg 7¢ 4¢, Pail 7¢
Fraser's, in boxes	¢ dos \$0.50
Dixon's Everlasting, in box	¢ dos 1¢
Dixon's Everlasting, 10-15 pails, ea. 85¢	
Lower grades, special brands	¢ gr \$5.50

Axles	
No. 1	4¢
No. 7 to 18	6¢
No. 19 to 22	6¢
National Wrought Steel Tubular Self-Oiling	
Standard Farm (1 to 5) and Special Farm (A1 to A5)	
Less than 10 sets	33¢
Over 10 sets	33¢
X Strong Exp. (6 to 9) and XX Strong Truck (10 to 16)	
Less than 10 sets	10¢
Over 10 sets	10¢

Bag Holders	
Sprengle's Pat.	¢ dos \$18, dis 60%
Balances	
Spring Balances	50%
Common 24-lb	¢ dos \$1.50, dis 50%
Chatillon's Spring Balances	50%
Chatillon's Circular Spring Balances	60%

Bells	
Hand	
Light Brass	70¢
Extra Heavy	80¢
White Metal	60¢
Saw Chime	33¢
Gibbs (Cone's Patent)	25¢
Door	
Gong, Abbe's	33¢
Gong, Yankee	45¢
Gong, Barton's	40¢
Crank, Taylor's	25¢
Crank, Brooks	50¢
Crank, Cone's	10%

Bellevue	
Blacksmiths	50¢
Molders	40¢
Hand Belows	40¢
Belting, Rubber	
Common Standard	70¢
Standard	70¢
Extra	60¢
N. Y. B. & P. Co., Standard	60¢
N. Y. B. & P. Co., Extra Standard	50¢

Bench Stops	
Morrill's	¢ dos \$0, dis 50%
Hutchins's	¢ dos \$5, dis 10¢
Weston's	¢ dos \$1, \$10, dis 25¢
McGill's	¢ dos \$3, dis 10%
Bits	
Auger, Gimlet, Bit Stock, Drills, &c.	see Augers and Bits
Bit Holders	
Extension, Barber's	¢ dos \$15.00, dis 40%
Extension, Ives	¢ dos \$20.00, dis 60%
Diagonal	¢ dos \$24.00, dis 40%
Angular	¢ dos \$24.00, dis 40%

Blind Fasteners	
Mackrell's	¢ dos pairs, \$1.00, dis 30%
Van Sand's Screw Pattern	\$15.00
Van Sand's Old Pattern	\$15.00
Washburn's Old Pattern	\$9.00
Merriman's	new list, net
Austin & Eddy No. 2008	\$9.00
Security Gravity	\$9.00
Blind Staples	
Barbed, 1/4 in. and larger	¢ dos 7¢
Barbed, 1/2 in.	¢ dos 8¢

Blocks	
Cleveland Block Co., Mal. Iron	50%
Novalty Tackle Blocks, Mal. Iron	50%
Bolts	
Door and Shutter	
Cast Iron Barrel, Square, &c.	70¢
Cast Iron Shutter Bolts	70¢
Cast Iron Chain (Sargent's list)	65¢
Ives' Patent Door Bolts	60%
Wrought Barrel	70¢
Wrought Square	70¢
Wrt Shutter, all Iron, Stanley's	60¢
Wrt Shutter, Brass Knob	40¢
Wrt Shutter, Sargent's list	55¢
Wrt Sunk Flush, Stanley's list	50¢
Wrt Sunk Flush, Stanley's list	55¢
Carriage	
Com. list June 10, '84	75¢
Genuine Eagle, list Oct. '84	75¢
Phila. pattern, list Oct. '84	75¢
R. B. & W., old list	70%

Stove and Plow	
Stove	65¢
Plow	65¢
Am. S. Co. Stove, Annealed	65¢
R. B. & W. Stove	65¢
R. B. & W. Stove	65¢
R. E. Mfg. Co. Stove	65¢
Machine, according to size	75¢
Bolt Ends, according to size	75¢
Borax	¢ dos 9¢
Boring Machines	
Without	
Augers	
Douglas	\$5.50
Snell's, Rice's Pat.	5.50
Jennings	5.50
Other Machines	2.35
Phillips' Patent	7.00
With Augers	7.50

Bow Pins	
Humason, Beckley & Co.'s	60¢
Sargent & Co.'s	\$17 and \$18, dis 60%
Peck, Stow & W. Co.	50¢
Braces	
Backus, Nos. 110 to 114 and 31 to 33	60¢
Backus, Nos. 6, 8, 12, 14	60¢
Backus, Nos. 16, 18, 20, 22, 7, 9, 11	70¢
Barber's, Nos. 10 to 16	50%
Barber's, Nos. 30 to 33	50%
Barber's, Nos. 40 to 63	50%
Barber's, Nos. 8, 10 and 12	75%
Barber's, Plated, Nos. 8, 10 and 12	65%
Osgood's Ratchet	40%
Spofford's	50%
Ives' New Haven Novelty	70%
Ives' New Haven Ratchet	60%
Ives' Barber Ratchet	60%
Ives' Barber	60%
Ives' Spofford	60%
Common Ball, American	\$1.10
Bartholomew's, Nos. 25, 27 and 30	50%
Bartholomew's, Nos. 117, 119	70%
Amidon's Barker's Imp'd Plain, 11 in.	80%
Amidon's Barker's Imp. Nickel, 65¢	10%
Amidon's Barker's Ratchet	75%
Amidon's Ellipse Ratchet	60%
Amidon's Globe Jawed	40%
Amidon's Corner Brace	40%
Amidon's Universal, 8 in.	\$2.10
Amidon's Buffalo Ball	\$1.10
P. S. & W.	60%

Brackets	
Shelf, plain, Sargent's list	55¢
Shelf, fancy, Sargent's list	60¢
Reading, plain	50¢
Reading, Rosette	60¢
Bright Wire Goods	87¢
Brilliers	
Hemis Self-Inch	9 10 9 11
Basting	Per doz. \$4.50 5.50 6.50
Buckets—See Well Buckets and Pails	
Bull Rings	
Union Co. Nut	55%
Sargent's	60%
Hutchins' low list	30%
Humason, Beckley & Co.'s	70%
Peck, Stow & W. Co.'s	50%
Ellrich Hdw. Co., White Metal, low list	50%
Butcher's Cleavers	
Bradley's	25¢
L. & I. J. White	30¢
Beatty's	40¢
Butts	
Brass	
Wrought Brass	70¢
Cast Brass, Tiebout's	33¢
Cast Brass, Corbin's, Fast	33¢
Cast Brass, Loose Joint	33¢
Cast Iron	
Fast Joint, Narrow	50%
Fast Joint, Broad	55%
Loose Joint	70%
Loose Joint, Japanned	70%
Loose Joint, Jap. with Acorns	70%
Parliament Butts	70%
Mayer's Hinges	70%
Loose Pin, Acorns	70%
Loose Pin, Acorns, Japanned	70%
Loose Pin, Acorns, Japanned	70%
Plated Tips	70%
Wrought Steel	
Fast Joint, Narrow	70%
Fast Joint, Lt. Narrow	70%
Fast Joint, Broad	70%
Loose Joint, Broad	70%
Table Butts, Beck Flaps, &c.	70%
Inside Blind, Regular	70%
Inside Blind, Light	70%
Loose Pin	70%
Bronzed Wrt Butts	40%
Calipers	
See Compasses	
Calks, Tee	
Gautier	¢ dos 5¢
Dewicks	¢ dos 5¢
Can Openers	
Messenger's Comet	¢ dos \$3.00, dis 25%
American	¢ gross \$3.00
Duplex	¢ dos 25¢, dis 15¢
Lyman's	¢ dos \$2.75, dis 20%
No. 4 French	¢ dos \$2.25, dis 55¢
No. 5 Iron Handle	¢ gr \$0.00, dis 45¢
Eureka	¢ dos \$2.50, dis 10%
Sardine Scissors	¢ dos \$2.75
Star	¢ dos \$2.75
Sprague, No. 1, \$2.00; 2, \$2.25; 3, \$2.50	
World's Best	¢ gross No. 1, \$12.00
No. 2, \$24.00; No. 3, \$36.00, dis 50%	
Universal	¢ dos \$3.00, dis 35¢
Domestic	¢ dos \$2.50, dis 45%
Champion	¢ dos \$2.00, dis 50%

Cards—
Horse & Curry.....10&10@10&10&10
Cotton.....New List, Aug. 1888.
Wool.....New List, Aug. 1888.
10&10@10&10

Carpet Stretchers—
Cast Steel, Polished.....\$ doz \$2.25
Cast Iron, Steel Points.....\$ doz \$0.4
Socket.....\$ doz \$1.75
Bullard's.....25@25&10%

Carpet Sweepers—
Bissell No. 5.....\$ doz \$17.00
Bissell No. 7 New Drop Pan.....\$ doz \$19.00
Bliss, Grand.....\$ doz \$34.00
Grand Rapids.....\$ doz \$24.00
Crown Jewel, No. 1.....\$18.00; No. 2.....\$19.00; No. 3.....\$20.00
Magic.....\$ doz \$15.00
Jewel.....\$ doz \$17.00
Improved Parlor Queen, Nickle.....\$ doz \$27.00
Improved Parlor Queen, Japaned.....\$ doz \$24.00
Excelsior.....\$ doz \$18.00
Garland.....\$ doz \$18.00
Parlor Queen.....\$ doz \$34.00
Housewife's Delight.....\$ doz \$15.00
Queen.....\$ doz \$16.00
Queen, with band.....\$ doz \$18.00
King.....\$ doz \$30.00
Weed, Improved.....\$ doz \$18.00
Hub.....\$ doz \$16.00
Cog-Wheel.....\$ doz \$22.00
Conqueror.....\$ doz \$22.00
Easy.....\$ doz \$22.00
Monarch.....\$ doz \$22.00
Goshen.....\$ doz \$22.00
Advance.....\$ doz \$18.00
Ladies' Friend, No. 1.....\$ doz \$15.00
No. 2.....\$ doz \$16.00
American.....\$ doz \$15.00
Grand Republic.....\$ doz \$35.00

Cartridges—
See Ammunition.

Casters—
Bed.....New List:
Plate.....\$5&5&5
Shallow Socket.....\$5&5&5
Deep Socket.....\$4&10
Yale Casters, list May, 1884.....\$3&10@40%
Yale, Gem.....\$6&6&5
Martin's Patent (Phoenix).....\$4&10@50%
Payson's Anti-friction.....\$6&6&10
"Giant" Truck Casters.....\$10&10&5
Stationary Truck Casters.....\$4&10

Cattle Leaders—
Humason, Beckley & Co.'s.....70%
Sargent's.....60%&10%
Hotchkiss.....30%
Peck, Stow & W. Co.....50&10%

Chain—
Trace, 6 1/2-10-2, exact, \$ pair, \$1.03
Trace, 6 1/2-10-3, exact, \$ pair, \$1.03
Trace, 7-10-2, exact, \$ pair, \$1.11
NOTE.—Traces, "Regular" sizes, 3¢ net
pair less than exact.
Log, Fifth, Stretcher, and other fancy
Chains, list Nov. 1, 1884.

American Coll., list of June 20, 1887
American Coll.....3-16 1/2 5-16 1/2
In case lots.....\$3.75 6.25 5.00 4.50
American Coll.....7-16 1/2 5-16 1/2
In case lots.....\$4.40 4.00 3.75 3.50
Less than case lots, add 1/4¢ per lb.
German Coll, list of June 20, 1887
German Coll.....50&10&50&60%
German Coll, list of June 20, 1887
German Coll.....50&10&50&60%
Covert Halter, Hitching and Breast
Covert Traces.....50&25
Onida Halter Chain.....60&30&25
Galvanized Pump Chain.....\$7&5@60%
Jack Chain, Iron.....75&75&5
Jack Chain, Brass.....70&70&5

Chalk—
White.....\$ gr 50¢
Red.....\$ gr 70¢
Blue.....\$ gr 85¢
White Crayons.....\$ gr 12¢@12 1/2¢, dis 10%

Chalk Lines—
See Lines.

Chisels—
Socket Framing and Firmer.
P. S. & W.....75&5@75&10%
New Haven and Middlesex.....
Mix.....
Ohio Tool Co.....
Buck Bros.....30%
Merrill.....60&10@60&10&5
L. & I. J. White.....30%&30&5
Wetherby & Douglas.....75&75&5
Tanged Firmers.....40&10%
Tanged Firmers, Butcher's.....\$4.75@45.00
Tanged Firmers, Spear & Jackson's.....\$5 to 2
Tanged Firmers, Buck Bros.....30%
Cold Chisels, \$ 10.....15@19¢

Chucks—
Beach Pat.....each, \$8.00, dis 20%
Morse's Adjustable.....each, \$7.00, dis 20%
Danbury.....each, \$6.00, dis 30%&30&5
Syracuse, Balf Pat.....25%

Clamps—
Providence Tool Co.'s Wrought Iron.....25%
Adjustable, Gray's.....20%
Adjustable, Lambert's.....20%
Adjustable, Snow's.....40&5
Adjustable, Hammers.....15%
Adjustable, Stearn's.....40&10%
Stearn's Adjustable Cabinet and Corner.....20&10%
Cabinet, Sargent's.....60%&10%
Carriage Makers', Sargent's.....70&10%
Eberhard Mfg. Co.....40&5@40&10%
Warner's.....40&10@40&10&5
Saw Clamps, see Vises.

Clips—
Norway, Axle, 1/4 & 5-16.....55&5&5
Second grade Norway Axle, 1/4 & 5-16.....65&5
Superior Axle Clips.....60%&5@60%&5&5

Norway Spring Bar Clips, 5-16, 60&5&5
Wrought-Iron Felloe Clips.....\$ 10, 51¢
Steel Felloe Clips.....\$ 10, 51¢
Baker Axle Clips.....25%

Cockeyes—
50%

Cocks, Brass.
Hardware list.....40. &10&25

Coffee Mills—
Box and Side, list revised Jan. 1, 1888.
American, Enterprise Mfg. Co. 20&10@30%
The "Swift," Lane Bros.....20&10%

Compasses, Dividers, &c—
Compasses, Calipers, Dividers, 70&70&10%
Bemis & Call Co.'s Dividers.....60&5
Bemis & Call Co.'s Compasses & Callipers.....50&5
Bemis & Call Co.'s Wing & Inside or Outside.....50&5
Bemis & Call Co.'s Double.....60%
Bemis & Call Co.'s (Call's Pat. Inside).....30%
Excelsior.....50%
J. Stevens & Co.'s Calipers and Dividers.....25&10%
Starrett's Spring Calipers and Dividers.....25&10%
Starrett's Lock Calipers and Dividers.....25&10%
Starrett's Combination Dividers.....25&10%

Coopers' Tools—
Bradley's.....20%
Barton's.....20@20&5
L. & J. White.....30&5
Albertson Mfg. Co.....25%
Beatty's.....40&40&5
Sandusky Tool Co.....30@30&5

Corkscrews—
Humason & Beckley Mfg. Co. 40&40&10%
Clouth's Pat.....33%&33%&5
Howe Bros & Hulbert.....35%

Corn Knives and Cutters—
Bradley's.....10%
Wadsworth's.....25%

Cradles—
Grain.....50&25

Crow Bars—
Cast Steel.....\$ 10, 4¢
Iron, Steel Points.....\$ 10, 3 1/2¢

Curry Combs—
Fitch's.....50&10@50&10&10%
Rubber.....per doz \$10.00, dis 20%
Perfect.....50%

Curtain Glass—
Silvered Glass.....net
White Enamel.....net

Cutlery—
Beaver Falls & Booth's.....33%
Wostenholme.....\$7.75 to 2

Dampers, &c—
Dampers, Buffalo.....50%
Buffalo Damper Clips.....50%
Crown Damper.....40%
Excelsior.....40&10%

Dividers—
See Compasses.

Dog Collars—
Embossed, Gilt, Pope & Steven's list.....30&10%
Leather, Pope & Steven's list.....40%
Brass, Pope & Steven's list.....40%

Door Springs—
Torrey's Rod, regular size.....\$ doz \$1.30
Gray's.....\$ gr. \$20.00, dis 20%
Bee Rod.....\$ gr. \$20.00, dis 20%
Warner's No. 1, \$ doz, \$2.50; No. 2, \$ doz, \$3.30; dis 40&10@50%
Gem (Coll), list April 19, 1888.....20%
Star (Coll), list April 19, 1888.....20%
Victor (Coll).....60&60&10%
Champion (Coll).....60&10@60&10&10%
Philadelphia.....5 in., \$5.00; 8 in., \$7.75.
Cowell's.....No. 1, \$ doz, \$18.00; No. 2, \$ doz, \$15.00; dis 50%
Rubber, complete.....\$ doz, \$4.50; dis 55&10%
Hercules.....50%
Shaw Door Check and Spring.....25@30&35%

Drawing Knives—
P. S. & W.....75&5
Mix.....75&10%
New Haven and Middlesex.....60&10&10%
Merrill.....75&75&5
Wetherby and Douglas.....15&10@25%
Watrous.....20&5
L. & I. J. White.....20&5
Bradley's.....35%
Adjustable Handle.....25@33%
Wilkinson's Folding.....25@25&5

Drills and Drill Stocks—
Blacksmiths'.....each \$1.75
Blacksmiths' Self-Feeding.....each \$7.50, dis 20%
Breast, P. S. & W.....40&10%
Breast, Wilson's.....30&5
Breast, Millers Falls.....each \$3.00, dis 25%
Breast, Bartholomew's.....each \$2.50, dis 25&10@40%

Drills and Drill Stocks—
Ratchet, Merrill's.....20@20&5
Ratchet, Ingersoll's.....25%
Ratchet, Whitney's.....20@20&5
Ratchet, Weston's.....20@25%
Ratchet, Moore's Triple Action.....25@30%
Whitney's Hand Drill, Plain, \$11.00; Adjustable, \$12.00.....dis 20&10%
Wilson's Drill Stocks.....10%
Automatic Boring Tools.....each \$1.75¢
Turist Drills—
Morse.....50&10&5
Standard.....50&10&5
Syracuse.....50&10&5
Cleveland.....50&10&5
Williams.....60&10&10%

Drill Bits—
See Augers and Bits.

Drill Chucks—
See Chucks.

Dripping Pans—
Small sizes.....\$ 10, 6 1/2¢
Large sizes.....\$ 10, 6 1/2¢

Egg Beaters.

Dover.....\$ doz \$2.00
National.....\$ doz \$4.50, dis 33%
Family (T. & S. Mfg. Co.).....\$ gro \$17.00@
Kingston (Standard Co.).....\$ gro \$5.50
Acme (Standard Co.).....\$ gro \$5.00
Duplex (Standard Co.).....\$ gro \$15.00
Rival (Standard Co.).....\$ gro \$12.00
Triumph (T. & S. Mfg. Co.).....\$ gro \$10.50@
Advance, No. 1.....\$ gro \$10.50
Advance, No. 2.....\$ gro \$10.00
Bryan's.....\$ gro \$15.00
Ayres' Spiral.....\$ gro \$5.00
Double (Hamblin & Russell Mfg. Co.).....\$ gro \$16.30
Easy (Hamblin & Russell Mfg. Co.).....\$ gro \$14.00
Triple (Hamblin & Russell Mfg. Co.).....\$ gro \$16.20
Spiral (Hamblin & Russell Mfg. Co.).....\$ gro \$4.50
Paine, Diehl & Co.'s.....\$ gro \$24.00

Egg Poachers—
Buffalo Steam Egg Poachers, \$ doz, No. 1, \$6.00; No. 2, \$6.00.....dis 25%

Electric Bell Sets—
Wollensak's.....20%
Bigelow & Dowse.....20%

Emery—
No. 4 to 46 gr. 150 gr. 2 1/2¢
Kegs, \$ 10, 4¢ 5¢ 2 1/2¢
1/2 kegs, \$ 10, 4¢ 5¢ 2 1/2¢
1/4 kegs, \$ 10, 4¢ 5¢ 2 1/2¢
10 lb cans, 10¢ 6 1/2¢ 5¢
in case.....6¢ 6 1/2¢ 5¢
10 lb cans, less than 10.....10¢ 10¢ 7 1/2¢

Enameled and Tinned Ware—
See Hollow-Ware.

Escutcheon Pins—
Iron, list Nov. 11, 1885.....50&10@50&10&5
Brass.....60@60&5

Escutcheons.

Door Lock.....Same dis as Door Locks.
Brass Thread.....60@60&10%
Wood.....25%

Faucets—

Fenn's.....40%
Bohren's Pat. Rubber Ball.....25%
Fenn's Cork Stops.....33%
Star.....60%
Frary's Pat. Petroleum.....40&5&25
West's Pat. Key.....50&10%
Anchor Lock.....45%
Metallic Key, Leather Lined.....60&10&10%
Cork Lined.....70&5@70&10%
Burnside's Red Cedar.....50%
Burnside's Red Cedar, bbl lots.....50&10%
John Sommers'.....
Perkins Best Block Tin Key.....40%
IXL, list quality, Cork Lined.....50%
Diamond Lock.....50%
Perfection, Fla. Red Cedar.....50%
Goodenough Cedar.....50%
Boss Metallic Key.....50%
Reliable Cork Lined.....60%
Western Pattern Cork Lined.....50%
Self-Measuring Enterprise, \$ doz \$50.00
Self-Measuring, Lane's, \$ doz \$36.00
Self-Measuring, Victor, \$ doz \$36.00
dis 25&10%
dis 25&10%
dis 25&10%
Felloe Plates.....\$ 10, 6@6 1/2¢
Fifth Wheels—
Derby and Cincinnati.....45&5

Files—

Domestic—
Nicholson Files, Rasps, &c.....60&5@60&10%
Nicholson (X. F.) Files.....25%
Nicholson's Royal Files (Second).....75% (extra prices on certain sizes)
Other makers, best brands.....60&5@60&10&5
Fair brands.....60&10@60&10&5
Second quality.....70&5@75%
Heller's Horse Rasps.....60&7 1/2@60&10%
McCaffrey's Horse Rasps.....60&10%

Imported—
J. & Riley Carr.....list, April 1, 1883, 15%
J. & Riley Carr Horse Rasps.....10%
Moss & Gamble.....list, April 1, 1883, 15%
Butcher.....Butcher's list, 20%
Stubbs.....Stubbs list, 25@30%
Turton's.....Turton's list, 20@25%
Greaves' Horse Rasps, American list, 60%

Fluting Machines—
Knox, 4 1/2-inch Rolls.....\$3.25 each 35%
Knox, 6-inch Rolls.....\$3.80 each 35%
Eagle, 3 1/2-inch Roll.....\$2.15, dis 35%
Eagle, 5 1/2-inch Roll.....\$2.85, dis 35%
Crown, 4 1/2 in., \$3.50; 6 in., \$4.00; 8 in., \$4.50 each
Crown Jewel, 6 in.....\$8.50 each, 35%
American, 5 in., \$3.00; 6 in., \$3.40; 7 in., \$4.50 each
Domestic Fluter.....\$1.50 each net
Geneva Hand Fluter, White Metal.....\$ doz \$12, dis 25%
Crown Hand Fluter, Nos. 1, \$15.00; 2, \$12.50; 3, \$10.00.....dis 30%
Shepard Hand Fluter, No. 85 \$ doz \$15.30
Shepard Hand Fluter, No. 110 \$ doz \$11.00
Hand Fluter, No. 96 \$ doz \$8.00, dis 40%
Clark's Hand Fluter, \$ doz \$15.00, dis 35%
Combined Fluter and Sad Iron, \$ doz \$15.00, dis 10%
Buffalo.....\$ doz \$10.00, dis 10%

Fluting Scissors—
45%

Fodder Squeezers—

Blair's.....\$ doz \$2.00
Blair's "Chimax".....\$ doz \$1.25

Forks—
Hay, Manure, &c., Asso. List.....65%
Hay, Manure, &c., Phila. List.....60@60&5
Plated, see Spoons.

Freezers, Ice Cream—

Buffalo Champion.....60&10&5
Shepard's Lightning.....65%
White Mountain.....60%

Fruit and Jelly Presses—

Enterprise Mfg. Co.....20&10@30%
P. D. & Co.....\$ doz \$3.75@4.00
Shepard's Queen City.....\$ doz \$3.75@4.00

Fry Pans—

High List.....75&5@75&10
No.....0 1 2 3 4
\$ doz.....\$3.75 \$4.70 \$5.30 \$5.95 \$6.55
No.....5 6 7 8
\$ doz.....\$7.50 \$8.75 \$10.00 \$11.25
Low List.....65&10%
No.....0 1 2 3 4
\$ doz.....\$3.00 \$3.75 \$4.25 \$4.75 \$5.25
No.....5 6 7 8
\$ doz.....\$6.00 \$7.00 \$8.00 \$9.00

Fuse—
\$ 1000 ft.

Common Hemp Fuse, for dry ground, \$2.70
Common Cotton Fuse, for dry ground 2.85
Single Taped Fuse, for wet ground.....4.75
Double Taped Fuse, for very wet gr.....6.00
Triple Taped Fuse, for very wet gr.....7.25
Small Gutta Percha Fuse, for water, 7.50
Large Gutta Percha Fuse, for water, 12.00

Gauges—

Marking, Mortise, &c.....60&10%
Starrett's Surface, Center and Scratch, 25&10%
Wire, low list.....10&10%
Wire, Wheeler, Madden & Co.....10%
Wire, Morse's.....50@50&5
Wire, Brown & Sharpe's.....10@20%

Gimlets—

Nail and Spike.....50&10&5
"Eureka," Gimlets.....40&10%
"Diamond" Gimlets.....\$ gr \$5.00
Double Cut, Shephardson's.....45&4&5
Double Cut, Ives.....60@60&5
Double Cut, Douglass.....40&10%
"Bee".....\$ gr \$12, dis 25&25&5

Glue—

Le Page's Liquid.....25@25&5
Upton's Liquid.....35%
Le Page & Co.'s Improved Process.....25@25&5

Glue Pots—

Tinned and Enameled.....40&5@40&10%
Family, Howe's "Eureka".....40%
Family, L. F. C.'s "Handy".....50%

Grindstones—

Small, at factory.....\$ ton \$7.50@9.00

Grindstone Fixtures—

Sargent's Patent.....70&10%
Reading Hardware Co.....30&10%

Hack Saws—
See Saws.

Halters—

Covert's, Rope, 1/2-in. Jute.....50&25
Covert's, Rope, 1/2-in. Hemp.....40&25
Covert's Adj. Rope Halters.....40&25
Covert's Hemp Horse and Cattle Tie, 50&25
Covert's Jute Horse and Cattle Tie, 60&10&25

Hammers—

Handled Hammers—
Maydole's, list Dec. 1, '85.....25@25&10%
Buffalo Hammer Co., list Jan. 15, '87
Humason & Beckley.....50&50&10%
Atha Tool Co.....
Voyette R. Plumb.....40&10@50%
C. Hammond & Son.....40&10@50%
Verree.....5%
Magnetic Tack, Nos. 1, 2, 3, \$1.25, 1.50 & 1.75.....dis 30&10%
Nelson Tool Works.....40&10%
Warner & Nobles.....20@25%
Peck, Stow & Wilcox.....40%
Sargent's.....33%&10%

Heavy Hammers and Sledges—
3 lb and under.....\$ 10, 40¢
3 to 5 lb.....\$ 10, 30¢
Over 5 lb.....\$ 10, 30¢
Report
Wilkinson's Smiths.....10¢@11¢

Handcuffs and Leg Irons—

Providence Tool Co., Handcuffs, \$15.00
\$ doz.....dis 10%
Providence Tool Co., Leg Irons, \$25.00
\$ doz.....dis 10%
Tower's.....25%
Daley's Improved Handcuffs: 2 Hands, Polished, \$ doz \$48.00; Nickle, \$57.00; 3 Hands, Polished, \$ doz \$72.00; Nickle, \$84.00.....dis 25%

Handles—

Iron, Wrought or Cast—

Door or Thumb.....
Nos.....0 1 2 3 4
Per doz.....\$0.90 1.00 1.18 1.35 1.50

Reggin's Latches.....\$ doz 30¢@35¢
Bronze Iron Drop Latches.....\$ doz 70¢ net
Jap'd Store Door Handles—Nuts, \$1.82; Plate, \$1.10; no Plate, \$0.88.....net
Barn Door.....\$ doz \$1.40, dis 10&10%
Chest and Lifting.....70%

Handles, Wood—

Saw and Plane.....40&10@40&10&5
Hammer, Hatchet, Axe, Sledge, &c.....40%
Brad Axl.....\$ gr \$2.00
Hickory Firmer Chisel, ass'd.....\$ gr \$2.50
Hickory Firmer Chisel, large.....\$ gr \$5.00
Apple Firmer Chisel, ass'd.....\$ gr \$5.00
Apple Firmer Chisel, large.....\$ gr \$5.00
Socket Firmer Chisel, ass'd.....\$ gr \$3.00
Socket Firmer Chisel, large.....\$ gr \$5.00
J. S. Smith & Co.'s Pat File.....50%
File, assorted.....\$ gr 2.75, dis 40%
Auger, assorted.....\$ gr 5.00, dis 40%
Auger, large.....\$ gr 7.00, dis 40%
Pat. Auger, Ives.....30&10%
Pat. Auger, Douglass.....\$ set \$1.25 net
Pat. Auger, Swan's.....\$ set \$1.00 net
Hoe, Rake, Shovel, &c.....60&10%

Cross-Cut Saw Handles—
Atkins, No. 1 Loop, 30¢; No. 3,
25¢; No. 3 and No. 4 Reversible, 22¢.
Boynton's Loop Saw Handles, 50¢, dis 80%
Champion.....15¢

Hangers—

Barn Door, old patterns.....60¢10¢10¢70¢
Barn Door, New England.....60¢10¢10¢70¢
Samson Steel Anti-Friction.....55¢
Orleans Steel.....55¢
Hamilton Wrought Wood Track.....55¢
U. S. Wood Track.....55¢
Champion.....60¢10¢
Rider and Wooster, Medina Mfg. Co.'s
List.....70¢
Climax Anti-Friction.....70¢
Climax Steel Anti-Friction.....50¢
Zenith for Wood Track.....50¢
Reed's Steel Arm.....50¢
Challenger, Barn Door.....50¢
Sterling's Improved (Anti-Friction).....55¢10¢
Victor, No. 1, \$15.00; No. 2, \$15.50; No.
3, \$18.00.....dis 50¢50¢
Chertree.....50¢10¢
Kiddie's.....50¢10¢
The "Boss".....50¢
East Anti-Friction.....50¢
Duplex (Wood Track).....50¢
Terry's Pat., ½ doz pr. 4 in, \$10.00; 5 in,
\$12.00.....dis 50¢50¢
Cronk's Pat., No. 4, \$12.00; No. 5, \$14.40;
No. 6, \$18.00.....dis 50¢10¢50¢
Wood Track Iron Clad, ½ ft. 10¢, dis 50%
Carrier Steel Anti-Friction.....50¢50¢50¢
Architect.....20¢10¢
Eclipse.....20¢10¢
Felix.....20¢10¢
Richards.....30¢30¢10¢
Lane's Steel Anti-Friction.....30¢30¢10¢
Ball Bearing Door Hanger.....30¢10¢25¢10¢
Warner's Pat.....30¢20¢10¢
Stearns' Anti-Friction.....30¢20¢10¢
Stearns' Challenge.....25¢10¢25¢10¢10¢
Faultless.....40¢40¢50¢
American.....40¢40¢50¢
Rider & Wooster, No. 1, 62¢; No. 2,
75¢.....dis 50¢10¢
Paragon, Nos. 1, 2 and 3.....40¢10¢
Paragon, Nos. 5, 5½, 7 and 8.....30¢10¢
Crescent.....60¢40¢10¢
Nickel Cast Iron.....50¢
Nickel Malleable Iron and Steel.....40¢
Scranton Anti-Friction Single Strap.....30¢
Scranton Anti-Friction Double Strap.....30¢
Universal Anti-Friction.....40¢
Wild West.....4 in. Wheel, \$15.00; 5 in,
Wheel, \$21.00.....dis 45¢
Star.....40¢10¢40¢10¢50¢
May.....50¢50¢10¢
Barry, \$5.00.....dis 40¢10¢

Harness Snaps— See Snaps.

Hatchets—

List Jan. 1, 1889.....35¢40¢
Isaiah Blood.....40¢40¢
Hunt's Shingling, Lath and Claw.....40¢40¢
Hunt's Broad.....40¢10¢50¢
Buffalo Hammer Co.....40¢10¢50¢
Hurd's.....40¢10¢50¢
Fayette R. Plumb.....40¢10¢50¢
Wm. Mann, Jr., & Co.....50¢40¢50¢
Underhill Edge Tool Co.....40¢40¢210¢
Underhill's, Haines and Bright Goods.....30¢40¢

C. Hammond & Son.....40¢10¢50¢
Simmons.....40¢10¢50¢
Peck's.....40¢10¢40¢10¢50¢
Kelly's.....50¢40¢50¢
Sargent & Co.....50¢
Ten Eyck Edge Tool Co.....40¢10¢40¢10¢50¢
Collins, following list.....10¢
Shingling, Nos. 1, 2, 3.....
Claw, Nos. 1, 2, 3.....
Lathing, Nos. 1, 2, 3.....
Each.....55¢ 60¢ 65¢ 75¢

Hay and Straw Knives—
Lightning.....Mfrs' price ½ doz \$18.00, dis 25%
Jobbers' Extras.....
Electric.....½ doz \$17, dis 30¢30¢50¢
Gem.....½ doz \$10

Wadsworth's.....40¢75¢40¢10¢
Carter's Needle.....½ doz \$11.50, dis 10%
Hatch's.....½ doz \$13.50, dis 14.00
Anburn Hay, Common and Spear Point.....50¢
Anburn, Straw.....40¢

Hinges—
Wrought Iron Hinges
Scrap and T.....70¢10¢50¢70¢10¢10¢
Screw Hook and.....6 to 12 in., ½ doz.....34¢
Scrap.....14 to 20 in., ½ doz.....34¢
Scrap.....22 to 30 in., ½ doz.....34¢
Heavy Welded.....6 to 12 in., ½ doz.....34¢
Hook.....14 to 20 in., ½ doz.....34¢
Hook.....22 to 30 in., ½ doz.....34¢
Screw Hook.....14 in., ½ doz \$2.45, dis 10%
and Eye.....½ doz \$3.80, dis 10%
Rolled Blind Hinges, Nos. 32 and 34.....50¢10¢
Rolled Blind Hinges, Nos. 232 and 234.....55¢10¢
Rolled Plate.....70¢10¢
Rolled Raised.....70¢10¢
Plate Hinges, 8, 10 and 12 in., ½ doz.....5¢
"Providence" over 12 in., ½ doz.....4¢

Spring Hinges—
Geer's Spring and Blank Butts.....40¢
Union Spring Hinge Co.'s list, March,
1888.....20¢
Acme and U. S.....30¢
Empire and Crown.....30¢
Hero and Monarch.....50¢
American, Gem, and Star, Japanese.....20¢
American, Gem, and Star, Bronzed.....20¢
Oxford, Bronze and Brass.....20¢10¢
Barker's Double Acting.....20¢10¢
Union Mfg. Co.....25¢
Bombers.....30¢
Beckman's.....15¢20¢
Chicago.....30¢
Wiles.....10¢
Devore's.....10¢
Rex.....40¢

Gate Hinges—
Western.....½ doz \$4.40, dis 60%
Y. E.....½ doz \$7.00, dis 60%
M. E. Reversible.....½ doz \$5.50, dis 55¢10¢
Clark's, Nos. 1, 2, 3.....60¢10¢50¢
N. Y. State.....½ doz \$5.00, dis 55¢10¢
Automatic.....½ doz \$12.50, dis 50%

Common Sense.....½ doz pair \$4.50, dis 50%
Seymour's.....45¢10¢
Shepard's.....60¢10¢50¢
Reed's Latch and Hinges.....½ doz \$12.00, dis 50%

Blind Hinges—

Parker.....75¢25¢
Palmer.....50¢55¢10¢
Seymour.....70¢25¢
Nicholson.....45¢10¢
Huffer.....50¢
Clark's, Nos. 1, 3, 5, 40 and 50.....75¢10¢50¢80%
Clark's Mortise Gravity.....50¢
Sargent's, Nos. 1, 3, 5, 11, 13.....75¢10¢75¢10¢50¢
Sargent's, No. 12.....75¢10¢10¢
Reading's Gravity.....75¢10¢75¢10¢50¢
Shepard's Noiseless Niagara Buffalo,
Champion, Steamboat, Clark's Old
Pattern and Clark's Tip Pattern.....75¢10¢50¢
Shepard's O. S., Lull & Porter.....75¢10¢
Shepard's Acme, Lull & Porter.....75¢50¢
Shepard's Queen City Reversible.....75¢
Clark's Lull & Porter, Nos. 0, 1, 1½,
2, 2½, 3.....75¢10¢25¢
North's Automatic Blind Fixtures, No.
2, for Wood, \$10.50; No. 3, for Brk.,
\$13.50.....25¢25¢

Hoes—

Handled—
Garden, Mortar, &c.....65¢
Water Cotton, &c.....65¢
Warren Hoe.....60¢
Magic.....½ doz \$4.00

Eye—

D. & H. Scovill.....30¢
Lane's Crescent Planters Pattern.....45¢50¢
Lane's Razor Blade, Scovill Pattern.....30¢
Maynard, S. & O. Pat.....45¢50¢
Sandusky Tool Co., S. & O. Pat.....60¢
Hubbard & Co., S. & O. Pat.....60¢
Barr, S. & O. Pat.....60¢
Grub.....60¢40¢10¢

Hog Rings and Ringers—

Hill's Improved Ringers.....½ doz \$4.50
Hill's Old Style Ringers.....½ doz \$3.00
Hill's Tongues.....½ doz \$4.50
Hill's Rings.....½ doz bxs \$2.25, \$2.40
Perfect Rings.....½ doz bxs \$1.75, \$2.00
Perfect Ringers.....½ doz \$2.50
Blair's Hog Ringers.....½ doz \$2.00, \$2.25
Blair's Hog Rings.....½ doz \$6¢, \$1.00
Champion Ringers.....½ doz \$2.00
Champion Rings, Double.....½ doz \$2.25
Brown's Ringers.....½ doz \$2.00
Brown's Rings.....½ doz \$1.25, \$1.30

Hoisting Apparatus—

"Moore's" Hand Hoist, with Lock
Brake.....30¢
"Moore's" Differential Pulley Block.....40¢
Energy Mfg. Co.'s.....25¢

Holders, File and Tool—

Balz Pat.....½ doz \$4.00; dis 25%
Nicholson File Holders.....30%

Hollow-Ware—

Stove Hollow-Ware, Ground.....60¢50¢60¢10¢
Stove Hollow-Ware, Unground.....60¢10¢10¢70¢
Enameled and Tinned Hollow-Ware—
Kettles.....70¢70¢85¢
Oval Boilers, Saccapans and Gals.....40¢40¢50¢
Gray Enameled Ware.....50¢10¢50¢10¢50¢
Agate and Granite Ware.....25¢
Rustless Hollow-Ware.....50¢50¢50¢50¢
Galvanized Tea-Kettles—
Inch.....6 7 8 9
Each.....55¢ 60¢ 65¢ 75¢

Silver Plated—

4 mo. or 5 ½ cash in 30 days.
Reed & Barton.....40¢50¢
Meriden Britannia Co.....40¢50¢
Simpson, Hall, Miller & Co.....40¢50¢
Rogers & Brother.....40¢50¢
Hartford Silver Plate Co.....40¢50¢50¢
William Rogers Mfg. Co.....40¢50¢50¢

Hooks—

Cast Iron—
Bird Cage, Sargent's list.....60¢10¢10¢
Bird Cage, Reading.....60¢10¢10¢
Clothes Line, Sargent's list.....60¢10¢10¢
Clothes Line, Reading list.....60¢10¢10¢10¢
Ceiling, Sargent's list.....55¢10¢10¢
Harness, Reading list.....55¢10¢10¢10¢
Coat and Hat, Sargent's list.....55¢10¢10¢10¢
Coat and Hat, Reading.....50¢10¢10¢10¢

Wrought Iron—
Cotton.....½ doz \$1.25
Cotton Pat. (N. Y. Mallet & Hand Wks.).....30¢
Tassel and Picture T. & S. Mfg. Co.....50¢
Wrought Staples, Hooks, &c.....50¢
See Wrought Goods.
Bench Hooks.....See Bench Stops.

Wire—
Wire Coat and Hat, Gem, list April,
1886.....45¢
Wire Coat and Hat, Miles, list April,
1886.....45¢
Indestructible Coat and Hat.....45¢
Wire Coat and Hat, Standard.....45¢
Belt.....75¢10¢80¢
Grass, No. 2, \$2.00; No. 3, \$2.25; No. 4, \$2.50
Bush.....55¢60¢
Whitcomb Patent.....55¢
Hooks and Eyes—Malleable Iron.....70¢70¢10¢
Fish Hooks, American.....50%

Horse Nails—
Nos. 6 7 8 9 10
Ausable.....25¢ 25¢ 25¢ 24¢ 23¢
Clinton, Fin.....24¢ 22¢ 21¢ 20¢ 19¢
Essex.....28¢ 26¢ 25¢ 24¢ 23¢
Putnam.....24¢ 22¢ 21¢ 20¢ 19¢
Vulcan.....23¢ 21¢ 20¢ 19¢ 18¢
Northwest.....25¢ 23¢ 22¢ 21¢ 20¢
Globe.....23¢ 21¢ 20¢ 19¢ 18¢

Common Sense.....25¢ 23¢ 22¢ 21¢ 20¢
C. B. K.....25¢ 23¢ 22¢ 21¢ 20¢
Champlain.....28¢ 26¢ 25¢ 24¢ 23¢
New Haven.....28¢ 26¢ 25¢ 24¢ 23¢
Saranac.....23¢ 21¢ 20¢ 19¢ 18¢
Champion.....25¢ 23¢ 22¢ 21¢ 20¢
Capewell.....28¢ 26¢ 25¢ 24¢ 23¢
Star.....23¢ 21¢ 20¢ 19¢ 18¢
Anchor.....23¢ 21¢ 20¢ 19¢ 18¢
Western.....23¢ 21¢ 20¢ 19¢ 18¢
Empire Bronzed.....14¢ 13¢

Horse Shoes—See Shoes Horse.
Hose, Rubber—
Competition.....75¢10¢75¢10¢50¢
Standard.....70¢70¢10¢
Extra.....60¢40¢10¢
N. Y. B. & P. Co., Para.....30¢10¢
N. Y. B. & P. Co., Extra.....50¢
N. Y. B. & P. Co., Dundee.....60¢10¢50¢

Huskers—
Blair's Adjustable.....½ gr \$8.00
Blair's Adjustable Clipper.....½ gr 7.00

Jack Screws—See Screws.
Kettles—
Brass, 7 to 17 in., ½ doz.....24¢ 21¢
Brass larger than 17 in.....26¢ 23¢4¢
Enameled and Tea Kettles.....See Hollow-Ware.

Keys—
Lock Ass'n list Dec. 30, 1886.....50¢10¢
Eagle, Cabinet, &c.....35¢40¢
Hotchkiss Brass Blanks.....40¢
Hotchkiss, Copper and Tinned.....40¢
Hotchkiss, Pad and Cab.....35¢
Ratchet Bed Keys.....½ doz \$4.00, dis 15%
Wollensak Tinned.....50¢10¢

Knife Sharpeners—
Pardin's Applewood Handles.....½ doz \$6.00, dis 40%
Pardin's Rosewood or Cocobolo.....½ doz \$9.00, dis 40%

Knives—
Wilson's Butcher Knives.....25¢30¢
Ames' Butcher Knives.....25¢
Foster Bros' Butcher, &c.....40¢
Nichols' Butcher Knives.....40¢10¢
Ames' Shoe Knives.....20¢25¢
Ames' Bread Knives.....½ doz \$1.50, dis 15¢30¢
Moran's Shoe and Bread.....30¢
Hay and Straw.....See Hay Knives.
Table and Chair.....See Cutlery.
Corn, Auburn Mfg. Co. Western Pat.....\$2.00
Corn, Auburn Mfg. Co. Crescent.....\$3.50

Knobs—
Door Mineral.....65¢68¢
Door Por. Jap'd.....75¢78¢
Door Por. Nickel.....\$2.00, \$2.25
Door Por. Plated, Nickel.....\$2.00, \$2.25
Drawer, Porcelain.....60¢10¢60¢10¢10¢
Hemlock Door Knobs.....40¢10¢50¢
Yale & Towne Wood, list Dec. 1885.....40¢
Furniture, Plain.....75¢ gro inch, dis 10%
Furniture, Wood Screws.....25¢10¢
Picture, J. J. J.....60¢10¢10¢70¢
Picture, Sargent's.....70¢10¢
Picture, Hemlock.....35¢55¢
Shutter, Porcelain.....55¢10¢
Carriage, Jap.....½ gro 80¢, dis 80%

Ladies—
Melting, Sargent's.....55¢10¢
Melting, Reading.....85¢10¢
Melting, Monroe's Pat.....½ doz \$4.00, dis 40%
Melting, P. S. & W.....35¢10¢40¢
Melting, Warner's.....30%

Lawn Mowers—
Standard List.....60¢10¢
Enterprise.....60¢10¢

Lanterns—
Tubular—
Plain with Guards, ½ doz.....\$4.00, \$4.25
Lift Wire, with Guards, ½ doz.....\$4.50, \$4.75
Square Plain, with Guards, ½ doz.....\$4.00, \$4.25
Sq. Lift Wire, with Guards, ½ doz.....\$4.25, \$4.50
Without Guards, 25¢ ½ doz less.....\$7.25;
Police, Small, \$5.00; Medium, \$7.25;
Large, \$9.75.....dis 20¢25¢

Lemon Squeezers—
Porcelain Lined, No. 1, ½ doz \$6.00, dis 10%
Wood, No. 2.....½ doz \$3.00, dis 35%
Wood, Common.....½ doz \$1.70, \$1.75
Dunlap's Improved.....½ doz \$3.75, dis 20%
Samuels, No. 1, \$5.00; No. 2, \$6; 12,
\$18 ½ doz.....dis 22¢10¢
Jennings "Star".....½ doz \$2.50
Foster "Boss".....½ doz \$2.50
Dean's, Nos. 1, ½ doz \$6.50; 2, \$3.35; 3,
\$1.90.....50¢50¢50¢
Little Giant.....50¢50¢50¢
King.....40¢50¢

Lines—
Cotton and Linen Fish, Draper's.....50¢
Draper's Chalk.....60%
Draper's Mason, Linen, 84 ft. No. 1,
\$1.25; No. 2, \$1.75; No. 3, \$2.35; No. 4,
\$2.75; No. 5, \$3.25.....dis 25¢
Cotton Chalk.....55¢
Samson, Cotton, No. 4, \$2; No. 4½, \$2.50;
No. 5, \$3.....dis 10%
Silver Lake, Braided, No. 0, \$6.00; No.
1, \$6.50; No. 2, \$7.00; No. 3, \$7.50
Mason's Linen, No. 3½, \$1.50; No. 4,
\$2.00; No. 4½, \$2.50.....45%
Mason's Colored Cotton.....45%
Wire Clothes, No. 18, \$3.60; No. 19,
\$3.00; No. 20, \$2.50.....45%
Ventilator Cord, Samson Braided,
White or Drab Cot. ½ doz \$7.50, dis 20%

Locks, &c.—
Door Locks, Latches, &c.
List Dec. 30, '88, chgd Feb. 2, '89, dis
60¢10¢50¢25%
Mallory, Wheeler & Co., list July '88
60¢10¢40%
Sargent & Co., list Aug. 1, '88, 55¢25¢
Reading Hardware Co., list Feb. 2, '88,
55¢60¢10%
Livingston & Co.
Note.—Lower net prices often made
Perkins' Burglar Proof.....60¢25%
Plate.....35¢25%
F. Many's "Extension Cylinder" \$10.50
½ doz.
Barnes Mfg. Co.....40%
Yale Corrugated Key.....35¢45¢
Deltz Flat Key.....30%
L. & C. Round Key Latches.....30¢10%
L. & C. Flat Key Latches.....35¢45¢
Romer's Night Latches.....15%
Yale, new list.....35¢45¢
"Shepardson" or "U. S.".....65%
"Felter" or "American".....40¢10%
Seed's N. Y. Hasp Lock.....25%
Cabinet—
Eagle, Gaylord Par. list March, '84, rev.
ker and Corbin Jan. 1, '86, 35¢45¢
Deltz, Nos. 36 to 38.....40%
Deltz, Nos. 51 to 63.....40¢10%
Deltz, Nos. 86 to 90.....30%
Stoddard Lock Co.....30¢35¢45¢
"Champion" Night Latches.....40%
Barnes Mfg. Co.....40%
Eagle and Corbin Trunk.....25%
"Champion" Cab. and Combin.....35¢45¢
Yale.....35%
Romer's.....25%
Padlocks—
List Dec. 23, '84.....75¢75¢10%
Yale Lock Mfg. Co.'s.....35¢45¢
Eagle.....25¢25¢
Eureka, Eagle Lock Co.....40¢25¢
Romer's, Nos. 0 to 91.....35%
Romer's Scandinavian, &c., Nos. 100 to
505.....15%
A. E. Deltz.....40%
"Champion" Padlocks.....40%
Hotchkiss.....30%
"Star".....45%
Horsehoe.....½ doz \$9, dis 40%
Barnes Mfg. Co.....30%
Noel's.....25%
Brown's Pat.....25%
Scandinavian.....60¢40¢10%
Fram's Pat. Scandinavian new list (10¢)
Ames Sword Co. up to No. 150.....60%
Ames Sword Co. above No. 150.....50%

Lumber Tools.
Ring Peavies, "Blue Line" Finish ½ doz,
\$20.00
Ring Peavies, Common Finish ½ doz,
\$18.00
Steel Socket Peavies.....½ doz \$21.00
Mall. Iron Socket Peavies.....½ doz \$19.00
Cant Hooks, "Blue Line" Finish, per
doz.....\$16.00
Cant Hooks, Common Finish.....½ doz \$14.00
Cant Hooks, Mall. Socket Clasp, "Blue
Line" Finish.....\$16.00
Cant Hooks, Mall. Socket Clasp, Com-
mon Finish.....½ doz \$14.50
Cant Hooks, Clip Clasp, "Blue Line"
Finish.....½ doz \$12.00
Cant Hooks, Clip Clasp, Common Fin-
ish.....½ doz \$11.00
Hand Spikes.....½ doz 6 ft., \$15.00; 8 ft.,
\$20.00
Pike Poles, Pike & Hook, ½ doz, 12 ft.,
\$11.50; 14 ft., \$12.50; 16 ft., \$14.50;
18 ft., \$17.50; 20 ft., \$21.50
Pike Poles, Pike only, ½ doz, 12 ft.,
\$10.00; 14 ft., \$11.00; 16 ft., \$13.00; 18
ft., \$16.00; 20 ft., \$20.00
Pike Poles, not ironed, ½ doz, 12 ft.,
\$6.00; 14 ft., \$7.00; 16 ft., \$9.00; 18
ft., \$12.00; 20 ft., \$16.00
Setting Poles, ½ doz, 12 ft., \$14.00; 14
ft., \$15.00; 16 ft., \$17.00
Swamp Hooks.....½ doz \$13.00
Lustre—
Four-ounce Bottles.....½ doz, \$1.75; ½
gross.....\$17.00
Mallets—
Hickory.....20¢10¢20¢10¢10¢
Lignumvite.....20¢10¢20¢10¢10¢
B. & L. Block Co., Hickory & L. V.
30¢30¢10%
Match Safes—
Dangerfield's Self-Igniting.....½ doz \$1.50.
Mattecks, Regular list 60¢10¢60¢10¢50¢
Meat Cutters—
Dixon's ½ doz:
No. 1.....2 3 4
\$14.00 \$17.00 \$19.00 \$30.00, dis 40¢50¢
Woodruff's ½ doz:
Nos.....100 150
\$15.00 \$18.00.....dis 40¢50¢
Champion ½ doz:
Nos. 200 300 400
\$22.00 \$27.00 \$40.00.....dis 40¢45¢
Hales Pattern ½ doz:
Nos. 11 12 13
\$27.00 \$33.00 \$45.00, dis 70¢70¢50%
American.....1 2 3 4B
Each.....\$5 \$7 \$10 \$25 \$50 \$60
Enterprise.....10 12 22 32 42
Each.....\$3 \$2.50 \$4 \$6 \$15
Pennsylvania.....1 2 3 4
No.....1 2 3 4
½ doz.....\$24.00 \$28.00 \$36.00 \$28.00
Miles' Challenge ½ doz:
Nos. 1 2 3
\$22.00 \$30.00 \$40.00, dis 45¢45¢10%
Home No. 1.....½ doz, \$28.00, dis 55¢10%
Draw Cut, each:
Nos.....6 2 6 8
\$50 \$75 \$80 \$225.....20¢10¢30%
Beef Shavers (Erie).....20¢10¢30%
Chadborn's Smoked Beef Cutter.....½ doz
\$60.00
Mining Knives—
Am. (2d quality), ½ gr., 1 blade, \$7; 2
blades, \$12; 3 blades, \$18.....net
Lothrop's.....20¢10%
Smith's, ½ doz, Single, \$2.00; Double, \$3
40¢45%
Knapp & Cowles.....50¢10¢60%
Buffalo Adjustable.....½ doz, \$3.00, 25%

Molasses Gates—

Stebbin's Pat.	70¢@70¢1/2
Stebbin's Genuine	60¢@10¢1/2
Stebbin's Tinned Ends	40¢@10¢
Chase's Hard Metal	50¢@10¢
Bush's	30¢
Lincoln's Pattern	70¢@70¢1/2
Woods	30¢@10¢

Bos. # dos:

No. 1	2	3	4
\$7	\$8	\$9	\$10.60@10¢10¢

Money Drawers... # dos, \$18@320

Muzzles—

Safety... # dos, \$3.00 dis 25¢

Nails, see Trade Report.

Wire Nails & Brads, list July 14, '87

Wire Nails, Standard Penny... # keg

Lighting... # dos \$21.00

Nail Puller—

Curtiss Hammer... # dos \$9, net

Giant No. 1... # dos, \$30.00, 10¢

Pelican... # dos, \$30.00, dis 30¢

Bos... # dos, \$30.00, dis 30¢

Lighting... # dos \$21.00

Nail Sets—

Square... # gr, \$4.00@4.25

Round... # gr, \$3.25

Cannon's Diamond Point... # gr, \$12, 30¢

Nut Crackers—

Table (H. & B. Mfg. Co.)... 40¢

Blake's Pattern... # dos \$2.00, dis 10¢

Turner & Seymour Mfg. Co... 50¢

Nuts—

Nuts, off list Jan. 1, 1888: Square, Hex,

Hot Pressed... 5.4¢, 5.9¢

Cold Punched... 5.4¢, 5.9¢

In lots less than 100 #, #, add 1/4¢; 1-b

boxes, add 1¢ to list.

Oakum—

U. S. Government... # b \$4

U. S. Navy... # b \$7

Navy... # b \$6@6 1/4¢

Oilers—

Zinc and Tin... 65¢@55¢10¢

Brass and Copper... 50¢@10¢50¢10¢5¢

Malleable, Hammer, Improved, No. 1,

\$3.00; No. 2, \$4.00; No. 3, \$4.40 # dos

dis 10¢@10¢10¢

Malleable, Hammer, Old Pattern, same

list... 40¢

Prior's Pat. or "Paragon" Zinc,

60¢@10¢10¢

Prior's Pat. or "Paragon" Brass... 50¢

Olmiestad's Tin and Brass... 50¢

Olmiestad's Brass and Copper... 50¢

Broughton's Zinc... 60¢

Broughton's Brass... 50¢

Packing, Steam—

Rubber—

Standard... 60¢@10¢50¢10¢10¢

Extra... 50¢@10¢50¢

N. Y. B. & P. Co. Standard... 50¢@10¢5¢

N. Y. B. & P. Co. Empire... 70¢

N. Y. B. & P. Co. Salamander... # b 55¢, dis 30¢

Jenkins' Standard... # b 80¢, dis 35¢

Miscellaneous—

American Packing... 10¢@11¢ # b

Russia Packing... 14¢ # b

Italian Packing... 13¢@14¢ # b

Cotton Packing... 15¢@17¢ # b

Jute... 7¢@8¢ # b

Padlocks—

See Locks.

Pails—

Galvanized Iron—

Quarts... 10 12 14

Hill's Light Weight... # dos \$2.75 3.00 3.25

Hill's Heavy Weight... # dos 3.00 3.25 3.75

Whiting's... 2.75 3.00 3.25

Sidney Shephard & Co... 2.80 3.00 3.40

Iron Clad... 2.75 3.00 3.25

Fire Buckets... 2.75 3.25 3.50

Buckets, see Well Buckets.

Indurated Fibre Ware—

Star Pails, 12 qt... # dos \$4.50

Fire, Stable and Milk, 14 qt... # dos \$5.50

Pencils—

Faber's Carpenters'... high list 50¢

Faber's Round Gilt... # dos \$5.25 net

Dixon's Lead... # dos \$4.50 net

Dixon's Lumber... # dos \$5.75 net

Dixon's Carpenters'... # dos \$6.10¢

Picks—

Railroad or Adze Eye, 5 to 6, \$12.00; 6

to 7, \$13.00... dis 60¢@10¢50¢10¢5¢

Picture Nails—

Brass Head, Sargent's list... 50¢@10¢10¢

Brass Head, Combination list... 50¢@10¢

Porcelain Head, Sargent's list... 50¢@10¢10¢

Porcelain Head, Combination list... 40¢@10¢

Niles' Patent... 40¢

Pinkling Irons... # dos 65¢ net

Pipe, Wrought Iron—

List March 23, 1887.

1 1/2 and under, Plain... 50¢

1 1/2 and under, Galvanized... 47 1/2¢

1 1/2 and over, Plain... 55¢

1 1/2 and over, Galvanized... 55¢

Boiler Tubes, Iron... 60¢

Plane Irons—

Plane Irons	20¢@10¢
Plane Irons, Butcher's	\$5.00@5.25 to 2
Plane Irons, Buck Bros	30¢
Plane Irons, Auburn Tool Co., "This	40¢
is"	40¢
Sandusky Tool Co.	30¢
Single and Cut	40¢
Double	40¢
L. & I. J. White	25¢

Pliers and Nippers—

Button's Patent	30¢@10¢40¢
Hall's No. 2, 5 in., \$13.50; No. 4, 7 in.,	\$21.00 # dos
Humason & Beckley Mfg. Co.	50¢@50¢10¢
Gas Pliers, Custer's Nickel Plated	60¢
Eureka Pliers and Nippers	40¢
Russell's Parallel	25¢
P. S. & W. Cast Steel	30¢
P. S. & W. Tinner's Cutting Nippers	add 6¢ dis 10¢
Carew's Pat. Wire Cutters	20¢
Morrill's Parallel, # dos \$12.00, 30¢	5¢
Cronk's 8 in., \$15.00; 10 in., \$21.00,	40¢@40¢5¢

Plumbs and Levels—

Regular List	70¢@10¢70¢10¢10¢
Disson's	45¢@10¢
Pocket Levels	70¢@10¢70¢10¢10¢
Davis Iron Levels	10¢@10¢
Davis' Inclinoimeters	10¢@10¢

Peppers, Corn—

Round or Square, 1 qt. # gr \$12.00@15.00

Round or Square, 2 qt. # gr \$25.00@30.00

Post Hole and Tree Augers

Samson Post Hole Digger	# dos \$36.00,
	dis 25¢10¢
Fletcher Post Hole Augers	# dos \$36.00,
	dis 20¢
Eureka Diggers	# dos \$16.00@17.00
Lead's	# dos \$8.00@9.00
Vaughan's Post Hole Auger	\$13.00@14.00
Kohler's Little Giant	# dos \$18.00
Kohler's Hercules	# dos \$15.00
Kohler's New Champion	# dos \$15.00
Schneider	# dos \$18.00
Ryan's Post Hole Diggers	# dos \$24.00
Cronk's Post Bars	# dos \$40.00
Gibb's Post Hole Digger	dis 50¢5¢50¢10¢
	dis 40¢@40¢10¢

Potato Parers—

White Mountain	# dos \$5.00@5.50
Antrim Combination	# dos \$5.00
Hoosier	# dos \$13.50

Pruning Hooks and Shears—

Disson's Combined Pruning Hook and	Saw
	# dos \$15.00, dis 20¢10¢
Disson's Pruning Hook	# dos \$12.00,
	dis 20¢10¢
E. S. Lee & Co.'s Pruning Tools	40¢
Pruning Shears, Henry's Pat.	# dos
	\$3.75@4.00 net
Henry's Pruning Shears	# dos \$4.25@5.00
Wheeler, M. & Co.'s Combination	# dos \$13.00, dis 20¢
Dunlap's Saw and Chisel	# dos \$8.50,
	dis 30¢
J. Mallinson & Co., No. 1, \$5.25; No. 2, 7.25	

Pulleys—

Hot House, Awning, &c	60¢@10¢
Japanned Screw	60¢@10¢
Brass Screw	60¢@10¢
Japanned Slide	60¢@10¢
Japanned Clothes Line	60¢@10¢
Empire Sash Pulley	55¢@60¢
Moore's Sash, Anti-Friction	50¢
Hay Fork, Solid Eye, 5 ft. Swivel	\$4.50
Hay Fork, "Anti-Friction," 5 in. Solid,	\$5.70
Hay Fork, "F" Common and Pat.	dis 60¢
Bushed	20¢
Hay Fork, Tarbox Pat. Iron	20¢
Hay Fork, Reed's Self-Lubricating	30¢
Shoe Rack	45¢
Tackle Blocks	See Blocks

Pumps—

Cistern, Best Makers	50¢@10¢60¢
Pitcher Spout, Best Makers	50¢@10¢60¢
Pitcher Spout, Cheaper Goods	70¢@5¢

Punches—

Saddlers' or Drive, good quality	# dos
	60¢@5¢
Bemis & Call Co.'s Cast Steel Drive	50¢5¢
Bemis & Call Co.'s Spring Steel Socket	50¢5¢
Spring, good quality	# dos \$2.50@2.90
Spring, Leach's Pat.	15¢
Bemis & Call Co.'s Spring and Check	40¢
Solid Tinner's	# dos \$1.44, dis 55¢
"Tinner's" Hollow Punched	30¢5¢
Rice Hand Punches	15¢
Avery's Revolving	30¢@10¢
Avery's Saw-Set and Punch. See Saw Sets.	

Rail—

Sliding Door, Wrt' Brass, # b 35¢, dis 15¢	
Sliding Door, Branded Wrt' Iron, # ft. 7¢	
Sliding Door, Iron, Painted... # foot 4¢	
	dis 20¢10¢5¢
Barn Door, Light, In. 1/4 3/4 1 1/2	
Per 100 feet... \$2.50 3.00 4.40, dis 10¢	
B. D. for N. E. Hangers	
Per 100 feet... \$2.15 2.70 3.25, net	
Terry's Wrought Iron, # foot 4¢	
Victor Track Rail, 7¢ # foot... dis 50¢5¢	
Carrier Steel Rail, # foot... 4¢	

Rakes—

Cast Steel, Association goods	65¢
Cast Steel, outside goods	60¢@10¢70¢
Malleable	70¢@70¢5¢
Gibbs Lawn Rake	\$12.00, dis 50¢
Canton Lawn Rake	\$9.00, dis 50¢
Fr. Madison Prize Bow Brace and Peer	less
Fort Madison Steel Tooth Lawn Rake,	\$6.00, dis 25¢

Razors—

J. R. Torrey Razor Co.	20¢
Wootenholme and Butcher, \$10.00 to 2,	dis 10¢

Razor Straps—

Genuine Emerson	60¢@50¢5¢
Imitation " # dos \$2.00, dis 20¢10¢5¢	
Torrey's	30¢
Badger's Belt and Com	# dos \$2.00
Lamont Combination	# dos \$4.00

Rivets and Burrs—

Copper... 50¢@50¢10¢

Iron, list Nov. 17, '87... 50¢

Rivet Sets—

dis 50¢2¢50¢10¢

Rollers—

Barn Door, Sargent's list... 60¢@10¢10¢

Acme (Anti-Friction)... 55¢

Union Barn Door Roller... 70¢

Rope—

Manufacturers' prices for large lots:	
Manila... 1/4 in. and larger # b 14¢	
Ivory... 1/4 in. # b 14¢	
Manila... 1/4 and 5-16 in. # b 15¢	
Manila Tarred Rope... # b 13¢	
Manila Hay Rope... # b 14¢	
Sisal... 1/4 inch and larger # b 12¢	
Sisal... 1/4 and 5-16 in. # b 12¢	
Sisal Hay Rope... # b 13¢	
Sisal Tarred Rope... # b 11¢	
Sisal, Medium Lathe Yarn... # b 11¢	
Cotton Rope... # b 15¢18¢ net	
Jute Rope... # b 7¢	

Rules—

Boxwood	80¢@10¢90¢10¢10¢
Ivory	50¢50¢10¢
Starrett's Rules and Straight Edges	25¢10¢

Sad Irons—

From 4 to 10, at factory... # 100 #,	
	\$2.40@2.55
Self-Heating	# dos \$9.00 net
Self-Heating, Tailors	# dos \$18.00 net
Cleason's Shield and Toilet	25¢
Mrs. Post's Irons	40¢@40¢5¢
Enterprise Star Irons	40¢
Combined Fluter and Sad Iron	# dos
	\$15.00, dis 15¢
Fox Reversible, Self-Fluter	# dos \$24.00 net

Chinese Laundry (N. E. Butt Co.) 8¢

New England... 5¢, dis 15¢

Mahony's Troy Pol. Irons... 25¢

Sensible... 20¢@30¢5¢

Sand and Emery Paper and Cloth—

List April 19, 1888	35¢40¢
Sibley's Emery and Crocus Cloth	30¢

Sash Cord—

Common	# b 10¢11¢
Patent, good quality	# b 13¢13¢1/2
White Cotton Braided, fair quality	# b 28¢30¢
Common Russia Sash	# b 13¢
Patent	# b 15¢
Cable Laid Italian Sash	# b 22¢23¢
India Cable Laid	# b 13¢
Silver Lake, A Quality, White, 50¢	dis 10¢10¢5¢

Silver Lake, A Quality, Drab, 55¢

Silver Lake, B Quality, White, 50¢

Silver Lake, B Quality, Drab, 55¢

Silver Lake, C Quality, White (only)

Silver Lake, C Quality, White (only)

Sylvan Spring, Extra Braided, White, 34¢

Sylvan Spring, Extra Braided, Drab, 39¢

Semper Idem, Braided, White... 30¢

Egyptian, India Hemp, Braided... 25¢

Samson, Braided, White Cotton... dis 30¢30¢5¢

Samson, Braided, Drab Cotton, 55¢

Samson, Braided, Italian Hemp, 55¢

Samson, Braided, Linen, 80¢

Sash Locks—

Clark's, No. 1, \$10.00; No. 2, \$8.00 # gr,

Ferguson's... dis 35¢4¢

Morris and Triumph, list Aug. 16, 1888,

Victor... 60¢@10¢23¢

Walker's... 10¢

Attwell Mfg. Co... 25¢33¢4¢

Reading... 60¢@10¢60¢10¢10¢

Hammond's Window Springs... 40¢

Common Sense, Jap'd, Cop'd and

Br'd... gr \$4.00

Common Sense, Nickel Plated

Universal... 30¢

Kempshall's Gravity... 60¢

Kempshall's Model... 60¢@60¢10¢

Corbin

Machine—
Flat Head, Iron.....55¢
Round Head, Iron.....50¢
Bench and Hand—
Bench, Iron.....55¢10¢55¢10¢10¢
Bench, Wood, Beech.....\$ doz \$2.25
Bench, Wood, Hickory.....\$ doz \$2.25
Hand, Wood.....25¢10¢25¢10¢55¢
Lag, Blunt Point.....75¢75¢10¢
Coach and Lag, Gimlet Point.....75¢
Bed.....25¢55¢
Hand Rail, Sargent's.....60¢10¢10¢
Hand Rail, H. & B. Mfg. Co.....70¢10¢75¢
Hand Rail, A. N. Screw Co.....75¢
Jack Screws, Millers Falls List.....50¢50¢55¢
Jack Screws, P. S. & W.....85¢
Jack Screws, Sargent.....60¢10¢50¢10¢55¢
Jack Screws, Stearns.....40¢40¢10¢

Scroll Saws—
Lester, complete, \$10.00.....25¢
Rogers, complete, \$4.00.....25¢
Barnes' Builders' and Cabinet Makers' \$15.....25¢
Barnes' Scroll Saw Blades.....35¢

Seythe Snaths.....50¢25¢

Shears—
American (Cast) Iron.....75¢10¢75¢10¢55¢
Pruning.....See Pruning Hooks and Shears
Barnard's Lamp Trimmers.....\$ doz \$3.75
Timmers.....20¢25¢
Seymour's, List, Dec. 1881.....60¢10¢10¢50¢10¢10¢55¢
Heinrich's, List, Dec. 1881.....60¢10¢10¢50¢10¢10¢55¢

Heinrich's Tailor's Shears.....35¢45¢
First quality C. S. Trimmers.....80¢80¢10¢
Second quality C. S. Trimmers.....80¢80¢10¢

Acme Cast Shears.....90¢10¢50¢10¢10¢
Diamond Cast Shears.....10¢10¢
Clippers.....10¢10¢
Victor Cast Shears.....75¢10¢75¢10¢55¢
Howe Bros. & Hulbert, Solid Forged Steel.....40¢

Cleveland Machine Co., Solid Steel Forged.....70¢
Clausen Shear Co., Japaned.....70¢
Clausen Shear Co., Nickelplated, same list.....60¢

Sheaves—
Sliding Door—
N. W. & Co., List July, 1888.....50¢10¢50¢55¢
R. & E., List Dec. 18, 1885.....55¢20¢
Corbin's List.....80¢10¢25¢
Patent Roller.....80¢10¢25¢
Patent Roller, Hatfield's.....75¢
Russell's Anti-Friction, List Dec. 18, 1885.....60¢25¢
Moore's Anti-Friction.....60¢

Sliding Shutter—
R. & E., List Dec. 18, 1885.....60¢10¢25¢
Sargent's List.....60¢10¢
Reading List.....60¢10¢10¢

Ship Tools—
L. & I. J. White.....20¢25¢
Albertson Mfg. Co.....25¢

Shoes, Horse, Mule, &c.—
Horse—
Burden's, Perkins', Phoenix, at factory.....\$4.00

Mule—
Add \$1 ½ kg to above prices.
Or, Wrought—
Ton lots.....\$ 94
1000 a lots.....\$ 94
500 a lots.....\$ 106

Shot—
(Eastern prices 2¢ off, cash, 5 days.)
Drop, ½ bag, 25¢.....\$1.20
Drop, ½ bag, 5¢.....30¢
Buck and Chilled, ½ bag.....1.45
Buck and Chilled, ½ bag.....34

Shovels and Spades—
Ames' Shovels, Spades, &c., List Nov. 1, 1885.....20¢
Note.—Jobbers frequently give 5¢ 7½¢ extra on above

Griffith's Black Iron.....50¢10¢
Griffith's C. S.....60¢50¢10¢
Griffith's Solid C. S. R. R. Goods.....20¢
Old Colony (Sanford Fork & Tool Co.).....20¢
St. Louis Shovel Co.....20¢20¢75¢
Honey, Blinn & Co.....20¢20¢75¢
Hubbard & Co.....20¢20¢75¢
Lehigh Mfg. Co.....50¢10¢
Payne Petebone & Son, List January, 1886.....30¢
Remington's (Lowman's Patent).....30¢

Rowland's Black Iron.....30¢10¢40¢
Rowland's Steel.....60¢55¢60¢10¢

Shovels and Tongs—
Iron Head.....60¢10¢60¢10¢55¢
Brass Head.....60¢10¢10¢

Skins, Thimble—
Western List.....75¢55¢75¢10¢
Columbus Wrt. Steel, List Nov. 1, 1887.....20¢
Coldbrookdale Iron Co.....50¢10¢
Utica P. S. T. Skins.....60¢
Utica Turned and Pitted.....35¢

Sieves—
Buffalo Metallic, S. S. & Co., new list.....50¢25¢10¢
Barler Flour Sifters.....\$ doz \$2.00
Smith's Adjustable Sifters.....\$ doz \$2.25
Smith's Adjustable Milk Strainer.....\$ doz \$2.00
Smith's Adjustable F. & C. Strainer.....\$ doz \$1.75

Sieves, Wooden Rim—
Mesh 18, Nested, \$ doz.....70¢
Mesh 20, Nested, \$ doz.....85¢
Mesh 24, Nested, \$ doz.....\$1.00

Sinter—
School, by case.....50¢10¢

Snaps, Harness, &c.—
Anchor (T. & S. Mfg. Co.).....65¢
Fitch's (Bristol).....50¢10¢
Hochkies.....50¢10¢
Andrews.....50¢
Sargent's Patent Guarded.....70¢10¢10¢
German, new list.....40¢10¢
Covert.....50¢25¢
Covert, New Patent.....50¢55¢25¢
Covert, New R. E.....60¢25¢
Covert Spring.....60¢10¢10¢

Soldering Irons—
Covert's Adjustable, List Jan. 1, 1886.....35¢25¢

Spoke Shavers—
Iron.....45¢
Wood.....30¢
Bailey's (Stanley R. & L. Co.).....40¢10¢
Stearns.....30¢10¢30¢

Spoke Trimmers—
Bonney's.....\$ doz \$10.00, dis 50¢
Stearns.....50¢10¢
Ives, No. 1, \$15.00; No. 2, \$12.00.....55¢10¢
Douglas'.....\$ doz \$9.00, dis 20¢

Spoons and Forks—
Tinned Iron—
Basting, Cen. Stamp. Co.'s List.....70¢10¢
Solid Table and Tea, Cen. Stamp. Co.'s List.....70¢10¢
Buffalo S. S. & Co.....35¢45¢
Silver-Plated—(4 mos. or 5¢ cash 30 days)

Meriden Brit. Co., Rogers.....50¢
C. Rogers & Bros.....50¢
Rogers & Bros.....50¢
Reed & Barton.....50¢
Tins, Rogers Mfg. Co.....50¢10¢20¢
Simpson, Hall, Miller & Co.....50¢10¢
Holmes & Edwards Silver Co.....50¢10¢

H. & E. Silver Co., Mexican Silver.....50¢55¢
H. & E. Silver Co., Durham Silver.....50¢55¢
German Silver.....50¢50¢25¢
Garman Silver, Hall & Elton.....50¢55¢ cash
Nickel Silver.....50¢55¢50¢10¢55¢ cash
Britannia.....60¢

Boardman's Flat Ware.....50¢10¢
Boardman's Nickel Silver.....50¢
Boardman's Britannia Spoons, case lots.....60¢

Springs—
Elliptic, Concord, Platform and Half
Cliff's Bolster Springs.....60¢60¢25¢

Squares—
Steel and Iron.....75¢10¢80¢
Nickel-Plated.....75¢10¢80¢
Try Square and T Bevels.....60¢10¢10¢70¢
Diston's Try Square and T Bevels.....45¢10¢
Winterbottom's Try and Miter.....30¢10¢
Starrett's Micrometer Caliper Square.....25¢

Avery's Flush Bevel Squares.....30¢25¢

Staples—
Fence Staples, Galvanized.....Same price
Fence Staples, Plain.....as P. B. W. R. See Trl. Rep.

Steelyards.....40¢10¢50¢

Stocks and Dies—
Blacksmith's Waterford Goods.....30¢
Blacksmith's Butterfield's Goods.....30¢
Lighting Screw Plate.....50¢30¢10¢
Reece's New Screw Plates.....35¢10¢40¢

Stone—
Hindustan No. 1, 8¢; Axe, 3¢; Slips No. 1, 5¢
Sand Stone.....\$ 2¢
Washita Stone, Extra.....\$ 21¢25¢
Washita Stone, No. 1.....\$ 16¢10¢
Washita Stone, No. 2.....\$ 11¢15¢
Washita Slips, No. 1, Extra.....\$ 40¢45¢
Washita Slips, No. 1.....\$ 30¢35¢
Arkansas Stone, No. 1, 4 to 6 in.....\$ 1.35
Arkansas Stone, No. 1, 6 to 9 in.....\$ 1.75
Turkey Oil Stone, 4 to 8 in.....\$ 40¢
Turkey Slips.....\$ 11¢10¢
Lake Superior Chisel.....\$ 10¢
Lake Superior Slips, Chisel.....\$ 31¢35¢
Seneca Stone, Red Paper Brand.....\$ 15¢20¢

Seneca Stone, High Rounds.....\$ 20¢25¢
Seneca Stone, Small Whets.....\$ 34.00

Steve Polish—
Joseph Dixon's.....\$ gro \$5.00, dis 10¢
Gold Medal.....\$ gro \$4.50, dis 10¢
"Mirror".....\$ gro \$5.00, dis 25¢
Lustro.....\$ gro \$4.75 net
Ruby.....\$ gro \$3.75 net
Rising Sun, 5 gro lots.....\$ gro \$5.50
Dixon's Plumbago.....\$ 8¢ net
Boynton's Nook Day.....\$ 45.00
Parlor Pride Stove Enamel.....\$ gro \$15.00
Vater's Liquid, 2 3 5 10 gal cans
\$ gal.....\$0.90 .80 .70 .60
Yates Standard Paste Polish, 10 lb cans,
\$ 15¢

Jet Black.....\$ gro \$3.50
Japanes.....\$ gro \$3.50
Flintide.....\$ gro \$5.50
Diamond O. K. Enamel.....\$ gro \$19.00
Bonnell's Liquid Stove Polish.....\$ gro \$9.00
Bonnell's Paste Stove Polish.....\$ gro \$6.00
Black Eagle Benzine Paste, 5 and 10 lb cans.....15¢4¢
Black Jack Water Paste, 5 and 10 lb cans.....15¢4¢
Nickel Plate Paste.....\$ gro \$6.00

Tacks, Brads, &c.—
List, Jan. 2, 1888.—(Note.—Some manufacturers are selling Tacks at slightly higher prices than those named):
American Iron Carpet.....40¢50¢55¢
Steel Carpet.....80¢80¢25¢
Swedes Iron Carpet.....80¢80¢25¢
American Iron Cut.....75¢75¢10¢
Swedes Iron.....75¢25¢75¢10¢
Swedes Iron, Upholsterers'.....75¢10¢75¢10¢55¢
Tinned Swedes Iron.....75¢10¢75¢10¢55¢
Tinned Swedes Iron, Upholsterers'.....75¢10¢75¢10¢55¢
Gimp and Lace.....75¢10¢75¢10¢55¢
Swedes Iron Trimmers.....75¢10¢75¢10¢55¢
Swedes Iron Miners'.....75¢10¢75¢10¢55¢
Swedes Iron Bill Posters' or Railroad.....75¢10¢75¢10¢55¢
Swedes Steel (Swedes Iron price list).....80¢80¢25¢
Copper Tacks.....80¢80¢25¢
Copper Finishing, Trunk and Clout Nails.....50¢10¢
Finishing Nails.....70¢10¢70¢10¢10¢
Trunk and Clout Nails.....70¢10¢70¢10¢10¢
Tinned Trunk and Clout Nails.....70¢10¢
Basket Nails.....70¢10¢70¢10¢10¢

Common and Patent Brads, 70¢10¢70¢10¢10¢
Hungarian Nails.....70¢10¢70¢10¢10¢
Chair Nails.....70¢10¢70¢10¢10¢
Zinc Glaziers' Points.....50¢50¢25¢
Clear Box Nails.....50¢10¢50¢10¢55¢
Picture-Frame Points.....50¢10¢50¢10¢55¢
Looking-Glass Tacks.....50¢10¢50¢10¢55¢
Leathered Carpet.....50¢10¢50¢10¢55¢
Brush Tacks.....50¢10¢50¢10¢55¢
Shoe Finders, List Jan. 2, 1888, 10¢10¢
Lining and Saddle Nails, List Jan. 1, 1888:

Silvered.....30¢10¢10¢
Japaned.....20¢10¢10¢
Double-Pointed Tacks.....85¢
Wire Carpet Nails.....50¢10¢
Wire Brads & Nails, see Nails, Wire
Steel Wire Brads, K. & E. Mfg. Co.'s List.....50¢10¢

Tap Borers—
Common and Rind.....30¢10¢
Ive's Tap Borers.....35¢45¢
Enterprise Mfg. Co.....30¢10¢30¢
Clark's.....35¢45¢

Tapes, Measuring—
American.....25¢10¢
Spring.....40¢
Chesterman's, Regular list.....25¢30¢

Thermometers—
Tin Case.....80¢80¢10¢

Thimble Skins—See Skins.

Ties, Bale-Steel

Standard Wire, List.....50¢10¢25¢

Timbers' Shears, &c.—
Shears and Snips (P. S. & W.).....20¢25¢
Funches, see Funches.
Snips, J. Mallinson & Co.....35¢45¢

Tinware—
Stamped, Japaned and Pitted, List Jan. 20, 1887.....70¢10¢70¢10¢55¢

Tire Benders, Upsetters, &c.—
Stoddard's Lightning Tire Upsetters.....15¢
Detroit Perfected Tire Bender.....15¢

Tobacco Cutters—
Enterprise Mfg. Co. (Champion).....30¢10¢
Wood Bottom.....\$ doz \$5.00, dis 25¢
All Iron.....\$ doz \$4.25
Nashua Lock Co.'s \$ doz, \$15.00 50¢55¢
Wilson's.....\$ doz \$24, dis 55¢10¢
Sargent's.....\$ doz \$24, dis 55¢10¢
Acme.....\$ doz \$20.00, dis 40¢

Transom Lifters—
Wollensack's Class 3 and 4, Bronzed Iron.....50¢
Class 3 and 4, Bronze Metal.....25¢
Class 3 and 4, Brass.....35¢
Skylight Lifters.....35¢
Crown, Eagle and Shield.....50¢
Reiber's Bronzed Iron Rods, List Jan. 1, 1887.....50¢25¢
Reiber's Real Bronze or Nickel Plate.....50¢25¢
Excelsior.....50¢10¢25¢
Shaw's.....50¢10¢
Payson's Universal.....40¢40¢10¢

Traps—
Game—
Newhouse.....75¢40¢25¢
Oneida Pattern.....80¢70¢25¢
Game, Blake's Patent.....40¢10¢25¢
House and Rat—
Moore Wood Choker, \$ doz holes 11¢12¢
Mouse, Round Wire.....\$ doz \$1.50, dis 10¢
Mouse, Cage, Wire.....\$ doz \$2.50, dis 10¢
Mouse, Catch-em-alive.....\$ doz \$2.50, dis 15¢
Mouse, "Bonanza".....\$ gr \$10.00 net
Mouse Delusion.....\$ gr \$18.00, dis 15¢
Rat, "Decoy".....\$ gr \$10.00, dis 10¢
Ideal.....\$ gr \$10.00
Cyclone.....\$ gr \$5.25
Hotchkiss Metallic Mouse, 5-hole traps, \$ doz 90¢
In full cases.....\$ doz 75¢

Trowels—
Lothrop's Brick and Plastering.....25¢
Reed's Brick and Plastering.....15¢
Diston's Brk and Plastering, 25¢25¢10¢
Peace's Plastering.....25¢
Clement & Maynard's.....20¢
Rose's Brick.....15¢20¢
Brade's Brick.....25¢
Worrall's Brick and Plastering.....20¢
Garden.....70¢

Triers—
Butter and cheese.....25¢

Trucks, Warehouse, &c.—
B. & L. Block Co.'s List '82.....40¢

Tubes, Boiler—
See Pipe.

Twine—
Flax Twine.....BC. B.
No. 9, ¼ and ½ B Balls.....22¢ 30¢
No. 12, ¼ and ½ B Balls.....21¢ 29¢
No. 18, ¼ and ½ B Balls.....19¢ 28¢
No. 24, ¼ and ½ B Balls.....18¢ 28¢
No. 30, ¼ and ½ B Balls.....16¢ 27¢
No. 36, ¼ and ½ B Balls.....14¢ 26¢
No. 42, ¼ and ½ B Balls.....12¢ 25¢
Chalk Line, Cotton, ¼ B Balls.....25¢
Mason Line, Linen, ¼ B Balls.....55¢
2-Ply Hemp, ¼ and ½ B Balls (Spring Twine).....11¢4¢
3-Ply Hemp, ¼ B Balls.....12¢12¢4¢
3-Ply Hemp, ½ B Balls.....11¢11¢4¢
Cotton Wrapping, 5 Balls to B.....15¢15¢10¢
2, 3, 4 and 5-Ply Jute, ¼ B Balls.....10¢
Wool.....6½¢6½¢4¢
Paper.....15¢14¢
Cotton Mops, 6, 9, 12 and 15 lb to doz.....18¢

Vices—
Solid Box.....60¢60¢55¢
Parallel—
Fisher & Norris Double Screw.....15¢10¢
Stephens'.....25¢30¢

Parker's.....30¢25¢
Wilson's.....55¢
Howard's.....40¢
Bonney's.....40¢10¢
Millers Falls.....40¢40¢10¢
Trenton.....40¢55¢40¢10¢
Merrill's.....15¢25¢
Sargent's.....60¢10¢10¢
Backus and Union.....40¢
Double Screw Leg.....15¢10¢
Prentiss.....30¢55¢25¢
Simpson's Adjustable.....40¢

Saw Filers—
Bonney's, Nos. 2 & 3.....\$ doz \$15.00, dis 40¢10¢
Stearns'.....\$ doz \$10.00, dis 35¢45¢10¢
Stearns' Silent Saw Vices.....35¢45¢
Sargent's.....60¢10¢
Hopkins'.....\$ doz \$17.50, dis 10¢
Reading.....40¢10¢
Wentworth.....30¢10¢
Combination Hand Vices.....\$ gr \$43.00
Cowell Hand Vices.....30¢
Bauer's Pipe Vices.....10¢

Wagon Boxes—
Per B.....24¢

Wagon Jacks—
Daisy.....\$ doz \$4.00, dis 25¢

Washer Cutters—
Smith's Pat. \$ doz \$12.00, dis 30¢10¢10¢
Johnson's.....\$ doz \$11.00, dis 35¢45¢
Penny's.....\$ doz \$11.00, dis 35¢45¢
\$ doz \$11.00, dis 35¢45¢
Appleton's.....\$ doz \$16.00, dis 60¢10¢
Bonney's.....30¢10¢

Washers—
Size.....5-16 ¼ ½ ¾ 1
Washers.....7 5¼ 4¼ 3¼ 2¼ 1¼
In lots less than 200 B, \$ B, add ¼¢, 5-B boxes 1¢ to list.

Wedges—
Iron.....\$ B 34¢
Steel.....\$ B 4 ¢

Well Buckets, Galvanized—
Hill's.....\$ doz, 12 qt, \$4.25; 14 qt, \$5.25
Iron Clad.....\$ doz, 14 qt, \$4.50; \$4.50
Whiting's Flat Iron Band.....\$ doz \$4.25; \$4.25
Whiting's Wired Top.....\$ doz \$4.00; \$4.35

Well Wheels—
8 in., \$2.25; 10 in., \$2.70; 12 in., \$3.95.

Wire—
Iron—
Market, Br. & Ann., Nos. 0 to 18.....70¢10¢75¢
Market, Cop'd, Nos. 0 to 18.....70¢10¢75¢
Market, Galv., Nos. 0 to 18.....60¢25¢
Market, Tin'd, Tinned Nos. 0 to 18.....67¢45¢

Stone, Br. and Ann'd, Nos. 16 to 18.....75¢10¢25¢
Stone, Bright and Ann'd, Nos. 19 to 25.....75¢10¢25¢
Stone, Br. and Ann'd, Nos. 27 to 30.....75¢10¢25¢

Stone, Tinned.....70¢70¢10¢
Tinned Broom Wire.....70¢55¢70¢10¢
Galvanized Fence.....65¢
Annealed Fence, Nos. 8 and 9.....75¢
Annealed Grape, Nos. 10 to 14.....75¢
Brass, List Jan. 18, 1884.....15¢25¢
Copper, List Jan. 18, 1884.....15¢25¢
Barb Fence.....See Trade Report
Wire on Spools.....65¢
Malin's Steel and Tin'd Wire on Spools.....40¢

Malin's Brass and Cop. Wire on Spools.....30¢
Cast Steel Wire.....60¢
Stubs' Steel Wire.....\$6.00 to \$ 30¢
Steel Music Wire, Nos. 13 to 30, 55¢ B
Picture Wire.....60¢10¢
Barb Wire Safety Guards.....\$ 1000, \$9.00, dis 25¢
Wire Clothes Lines, see Lines.

Wire Cloth, Netting, &c.—
Painted Screen Cloth, No. 34.....\$ 100 sq. ft, \$1.90
Painted Screen Cloth, No. 36.....\$ 100 sq. ft, \$2.00
Galvanized Wire Netting.....70¢10¢75¢

Wire Goods—
See Bright Wire Goods.

Wire Rope—
List May 1, 1886.
Iron.....30¢
Cast Steel.....40¢

Wrenches—
American Adjustable.....40¢
Baxter's Adjustable "S".....40¢10¢50¢
Baxter's Diagonal.....40¢10¢50¢
Coe's Genuine.....55¢25¢
Coe's "Mechanics".....55¢10¢25¢
Girard Standard.....70¢10¢
Machinists' Sterling Wrench Co.....70¢10¢
Lamson & Sessions' Engineers'.....60¢10¢
Lamson & Sessions' Standard.....70¢10¢
Girard Agricultural.....80¢80¢25¢
Sterling Wrought.....80¢80¢25¢
Bemis & Call's Pat. Combination.....25¢
Bemis & Call's Merrick's Pattern.....25¢
Bemis & Call's Briggs' Pattern.....25¢
Bemis & Call's Cylinder or Gas Pipe.....40¢55¢

Bemis & Call's No. 3 Pipe.....35¢25¢
Aiken's Pocket (Bright), \$6.00, dis 50¢10¢
The Favorite Pocket (Bright).....\$ doz \$4.00, dis 40¢

Webster's Pat. Combination.....25¢
Bardman's.....30¢10¢
Always Ready.....25¢25¢
Alligator.....50¢
Donohue's Engineer.....30¢10¢
Acme, Bright.....60¢25¢
Acme, Nickelplated.....50¢25¢
Walker's.....55¢25¢
Diamond Steel.....55¢25¢

Wringers, Clothes—
List Jan., 1889, \$3.00 off.

Wrought Goods—
Staples, Hooks, &c., List Jan. 12, 1886.....80¢20¢55¢25¢

JANUARY 9, 1889.

Red Indian Dry	9 @ 12¢
Rose Pink	10 @ 13¢

THE IRON AGE

THURSDAY, JANUARY 17, 1889.

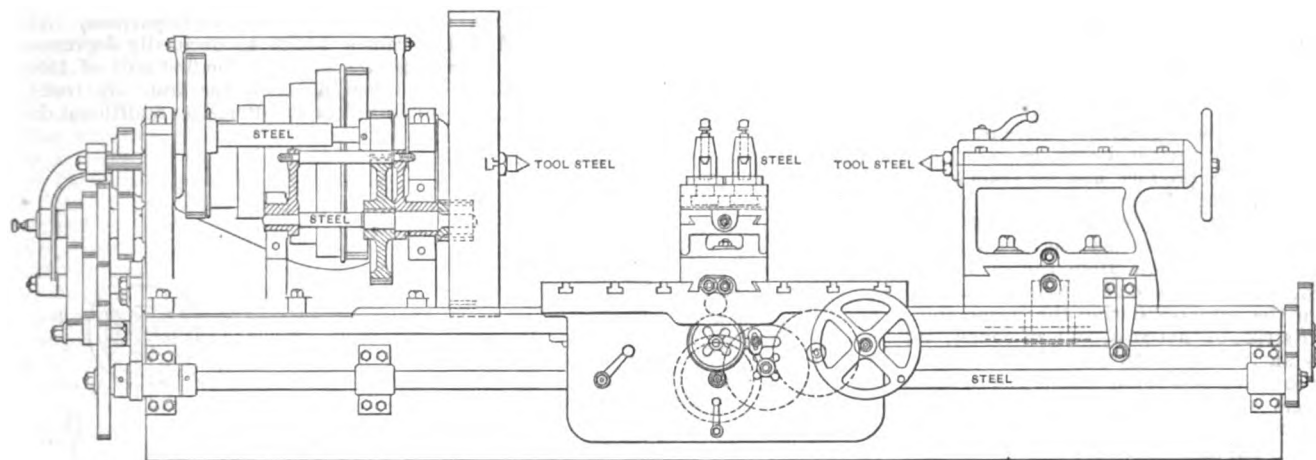
Turning and Boring Lathe for 6-Inch Breech-Loading Rifle Hoops.

On January 5, 1888, the Government received proposals for furnishing ten lathes to be especially designed for both turning and boring the steel hoops used in the construction of breech-loading guns. The firm of Israel H. Johnson, Jr. & Co., of Philadelphia, received a contract for five of these lathes, the aggregate price being \$23,298. The accompanying drawings represent side and end elevations and a plan

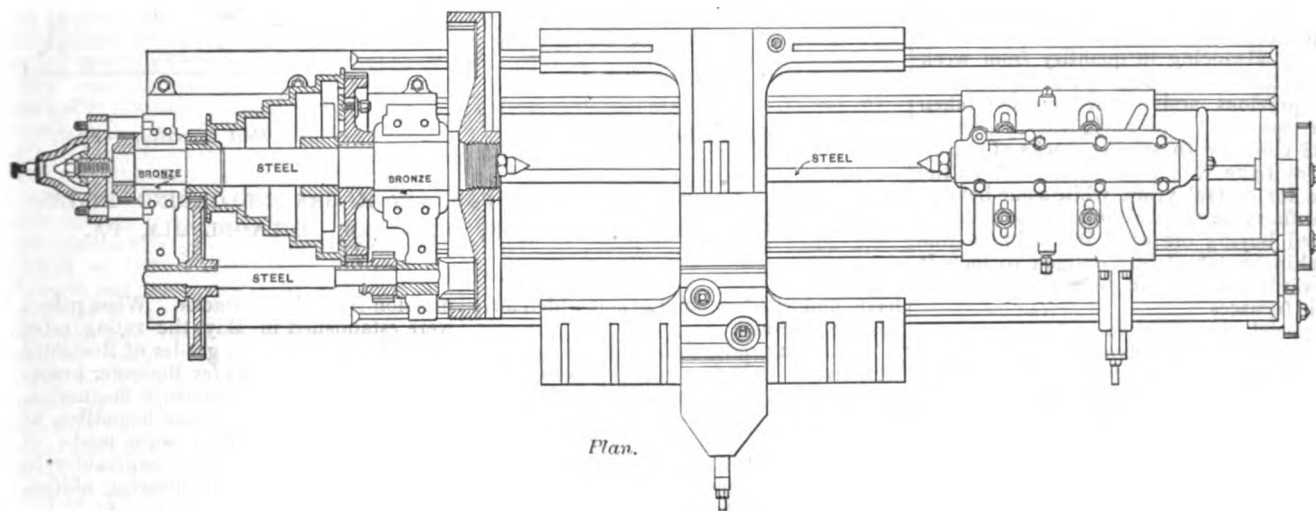
independent feed-rings, levers and cam frictions for lateral and cross-feeds, which are driven by bevel pinions mounted on long sleeves sliding on steel splined lead screw and supported in a sliding bracket. This gives the reverse motion to the carriage feeds and also locks the lead screw nut, thereby preventing both the nut and frictions being thrown in operation at the same time. When cutting screws the hand-wheel in the apron can be disengaged instantly. Three grades of feed, without changing gears, are obtained by means of

ing bar of suitable diameter. The tail-stock is moved on the bed by a rack and pinion, and is provided with a screw and releasing nut for power feed for boring.

In the drawings it will be noticed that the tail-stock is fed by a screw operated by gearing placed at the back end of the bed. This subjected the feed-screw to a compression strain, which, it was thought, in case of heavy work, might produce more or less deflection of the screw. For this reason the builders, after having been granted the contract, asked permission to



Side Elevation.



Plan.

TURNING AND BORING LATHE FOR 6-INCH BREECH-LOADING RIFLE HOOPS, BUILT BY ISRAEL H. JOHNSON, JR. & CO., PHILADELPHIA, PA.

view of the plans as adopted. The lathes have been constructed in accordance with these plans, with a single important exception, the reason for which will be explained further on.

The general dimensions of the lathe are: length 22 feet, bed 45 inches wide on top, distance between centers 13 feet, swing 50 inches over the ways of the bed and 38 inches over the carriage, weight 34,000 pounds. The cone has five changes for a 4-inch belt, the largest section being 30 inches in diameter. It is back-gearred 10 to 1 and triple-gearred 57 to 1, giving fifteen changes of speed. These gears are all engaged and disengaged by moving eccentric boxes. The front bearing of the spindle is 8 inches in diameter and 12 inches long; the back bearing is 5½ inches in diameter and 8½ inches long. The apron is provided with

compound or cone feed gears and pin on the head. The feeds can be changed from screw-cutting to turning without changing the gears. The bearings of the carriage are 5 feet long, and are gibbed to the bed the entire length. A clamp holds the carriage to the bed when the cross-feed is in use. The compound tool rest is formed with double slots for two or four tool posts, for clamping tools as desired. The carriage has power cross-feed and power feed to the compound rest top slide for turning angles; it also has a side rest for turning work the full swing of the lathe. All the dovetail slides are fitted with taper gibs and adjusting screws for taking up all wear. The tail-stock is made with a dovetail set-over, and gibbed to the bed. It is also arranged with a removable cap to permit the spindle to be replaced by a bor-

change the arrangement of this screw by operating it from the opposite end of bed, as the tail-stock would then be pulled against the work, instead of pushed, and, as the screw would only be acted upon by tension, the anticipated trouble could not occur. The suggestion was, of course, agreed to, and the lathes are being constructed with that change. The thrust bearing for this screw is at the inner end of the head.

The material of which each of the principal parts of the lathe is made is indicated on the drawings.

The annual meeting of the American Society of Civil Engineers was opened on Wednesday and will be continued this (Thursday) evening.

THE LAKE ORE TRADE.

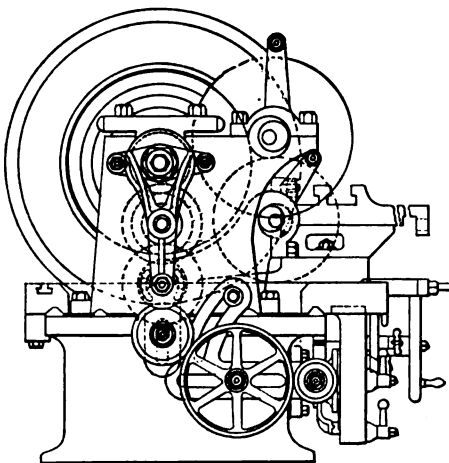
Outlook for the Coming Season.

Peculiar interest attaches at the present time to the Lake Superior iron-ore trade. In the face of adverse influences affecting the production of iron and steel, the demand for the raw material, iron ore, has recently been heavier on the Lake Superior mines than at any previous time since they were first developed. The consumption of Lake Superior ore approximated 6,000,000 tons in 1888, as against a fraction over 4,000,000 tons in any preceding year. This increased consumption occurred, notwithstanding a falling off in the production of steel rails, of bar iron and of many other kinds of iron and steel in 1888 as compared with 1887. It was quite as unexpected to those directly engaged in the trade as it has been to others. When the year 1888 opened with such discouraging prospects for the steel-rail makers the producers of Lake Superior iron ore felt that they had lost their mainstay, as so large a part of their product had for years gone into steel rails. To make the outlook still more discouraging, a heavy stock of unsold ore had been carried over at the Lake Erie receiving ports from the season of 1887, in consequence of the slack demand from the furnaces during the memorable coke strike of that year, and, of course, it was an incubus until sold and forwarded for consumption. And, further, large consumers of ore deferred making contracts for their season's supply until May and June, so that the mine owners were without their usual guide as to the probable requirements of the year, and in numerous cases arranged to curtail their production. But by midsummer the stocks at lower lake ports had melted away and increased shipments were necessitated from the mines, advancing in quantity from week to week until the aggregate shipments of the previous active year were overtaken and passed. The navigation season of 1888 closed with smaller stocks of unsold ore at Lake Erie ports than had been the case for several years, while some belated consumers in Central Ohio, who had deferred buying ore until it was impossible to ship by lake, were obliged to have it forwarded by all-rail from the mines to their furnaces.

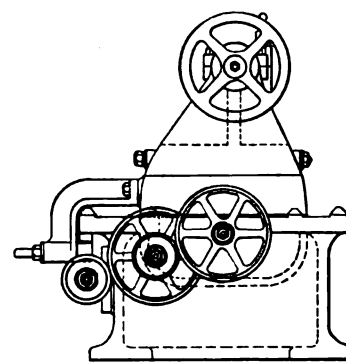
Special circumstances, of course, contributed to bring about this remarkable state of affairs. Prominent among them are the increased production of steel for miscellaneous purposes, and the newly developed market for Lake Superior ore east of the Alleghenies. While steel rails will for years continue to be the largest single interest absorbing iron ore, the use of steel for miscellaneous purposes is so rapidly growing as to promise in the near future to assume the leadership. Steel manufacturers will regulate the demand for ore as hitherto, but they will represent a score of products, and not steel rails alone. Fluctuations will occur necessarily, but they will not be so violent as when the demand is regulated by the steel-rail trade, which is subject to the mercurial character of the railroad interests. There is still much room to grow in the manufacture of steel for miscellaneous purposes, as the Government tables of importations show. With regard to the Eastern markets now opened to Lake Superior ore, it may be said with almost historical accuracy that 1888 witnessed the beginning of the trade in that direction. Lake Superior ore had been used to a limited extent for several years in a number of Eastern iron works, principally for fettling, but in 1888 docks were erected at Buffalo for the express purpose of handling ore expeditiously and in large

quantities, and the business of forwarding ore to Eastern blast furnaces was inaugurated on a proper basis. The railroads carrying anthracite coal to Buffalo assisted in the construction of the docks, and encouraged the movement of ore eastward by establishing low freight rates. Most opportunely for this trade, ocean freights on foreign ore were high in 1888, thus reducing in a great degree the competition from that quarter, and making the introduction of Lake Superior ore comparatively easy. About 250,000 tons of ore were forwarded to the East from Buffalo in 1888, and it is confidently expected that this amount will be doubled in 1889. An indication of the opinion entertained by Eastern ore-importing houses regarding the possibilities of this trade is shown in the very recent effort by a well-known firm to obtain control of the entire production of one of the leading Lake Superior mines. Even if ocean freights drop to their former figure, it is the belief of the Lake Superior ore men that they will be able to hold their ground in the East with the shipping facilities they now

While the year 1888 was fairly satisfactory to the ore interests, as might be presumed from the statistics given, it began with anxiety and uncertainty, continued to suffer some degree of demoralization until the shipping season was well over, and then wound up affairs with a stiff demand, better prices, and decidedly more confidence in the future. Contracts for the supply of ore were made unusually late by furnacemen last year. They had large stocks, and were in no hurry to add to them, while the price of pig iron was declining and the demand diminishing. With a possible necessity to curtail production confronting them, they deferred contracting for another year's supply of ore until they could see that it would be wanted. Those who knew what they would need held off to bear the market and to depress the price of ore as much as possible, even resorting to direct attacks in order to accomplish their purpose. All the causes which so decidedly depressed the iron market in the first half of 1888 had their effect on the iron ore trade, which, however, suffered an additional de-



End Elevation.—Head.



End Elevation.—Foot.

TURNING AND BORING LATHE FOR 6-INCH BREECH-LOADING RIFLE HOOPS. ISRAEL H. JOHNSON, JR. & CO., PHILADELPHIA, PA.

have, and with the connections which have been established.

The exact production of Lake Superior iron ore in 1888 has not yet been ascertained, but it is estimated by the *Marquette Mining Journal* to have been about 5,000,000 tons, or about 800,000 tons more than 1887, which had in its turn exceeded any previous year. Of this production about 40 per cent. was contributed by the Marquette range, about 25 per cent. each by the Menominee and Gogebic ranges, and 10 per cent. by the Vermillion range or Minnesota mines. At the close of Lake navigation for the season of 1888, according to the *Cleveland Iron Trade Review*, the quantity of unsold ore at Lake Erie ports was considerably less than 200,000 tons, as against 750,000 tons at the corresponding time in the previous year, showing that the ore shipments of the season of 1888 had gone directly into consumption, and with them had gone about 600,000 tons of stock carried over from the previous year. As it is further estimated by ore men who have looked carefully into this matter that at this time last year many furnaces were stocked with ore sufficient to carry them well into the fall, while they now have but enough to supply them until navigation opens, involving an increased consumption of fully 400,000 tons above that of last year, it can easily be seen how the consumption of 800,000 tons in 1888 is obtained.

pression from these attacks. When prices were established in May, the ruling rates were \$5.75 for the best grades of Bessemer magnetics, \$4.75 to \$5 for Bessemer hematites, \$4.75 for non-Bessemer magnetics, and \$3.75 for non-Bessemer hematites, at Lake Erie ports. Sales were made at rates under these by mining companies in need of money to meet pressing obligations. Lake freights opened at \$1.25 between Lake Erie ports and Ashland, \$1.25 Two Harbors, \$1.15 Marquette, and 90 cents to \$1 Escanaba. The lateness with which season contracts were made for ore by the furnacemen seriously interfered with the proper management of their business by the ore men. They were particularly handicapped in arranging for tonnage, and seriously felt it later in the season when the demand for ore increased and unemployed vessels were scarce. The higher prices received for ore inured largely to the benefit of the vesselmen under the circumstances. Bessemer magnetics sold for \$8, hematites, \$5.50, non-Bessemer magnetics, \$5 and hematites \$4.25 and \$4.50, at Lake Erie ports, while vessel freights advanced to \$1.70 from Ashland and Two Harbors, \$1.50 from Marquette and \$1.25 from Escanaba. The price of ore would in all probability have gone higher if the mines had not been prepared to meet the sudden demand which came upon them in midsummer. They had closed up the season of 1887 in

most excellent shape, with the expectation that the next year's requirements for ore would be larger. Hence dead work had been carried on, machinery had been overhauled and improved, large stock piles had been accumulated at the mines and the increased production was a matter of ease when the time arrived. The new mines of course contributed largely to this result. As to the profits of the year's business, the mine owners assert that only the best mines and the most carefully managed properties have earned dividends for their stockholders. Many mines have barely paid expenses and made the necessary additions to their plant and working capital.

So much for the past, and now for the future. On interviewing the mine owners and sales agents at Cleveland we find the opinion quite general that contracts for ore will be made much earlier than last year. A repetition of the experience of 1887 is not expected, when almost the entire output of ore for the year was sold in January and February, but, on the other hand, a much better opening of business is looked for than in 1888. If the price of Bessemer pig iron had kept up to the rates ruling last fall the furnacemen would have been placing their contracts for ore now. The quiet condition of the pig iron trade is influencing both buyers and sellers of ore. Buyers will naturally endeavor to get ore at lower prices than those prevailing at the close of the season, insisting that they cannot afford to pay them, while sellers will endeavor to hold prices up to these figures, so as to realize better results for their mines than accrued from last year's business. It is generally believed that a more active demand for pig iron will be felt by February 1, and that a better price for ore can be obtained by waiting until then rather than by attempting to force the market earlier. The general condition of business throughout the country being better now than it was at the opening of 1888, and disturbing elements being remarkably few and far less threatening, a prosperous year is anticipated, which should not be endangered by precipitous action. The condition of the ore interests is also much better. The Gogebic mines have recovered from the demoralization of the speculative era through which they passed in 1887, compelling a number of them to sell ore in 1888 at very low prices in order to meet pressing liabilities, and they can this year wait for the demand to mature. Some of the leading Lake Superior companies have already been asked to name prices for the season, it is true, but they have felt that the immediate conditions are not favorable for even the slight advance which they hope to get; and they have therefore declined to quote until they see an improvement in the iron trade. The general opinion is that inside of 30 days circumstances will develop in favor of fixing prices for the season, and that great activity will prevail in ore circles in February and March.

Careful investigation shows that a reasonable increase in production can be made this year. Some mines, like the Republic, Cleveland, Champion, Lake Superior, &c., will turn out about their usual quantity, without regard to an increased demand for ore, if it should come. Their owners prefer to work their properties regularly, with due regard to preserving them in good condition, and by careful management to secure good results, both in active and dull seasons. This policy is gaining more adherents from year to year. Newly opened mines, which have not been thoroughly developed, will of course endeavor to increase their output and enlarge their business. From them will come the increased production of the year. The mines on the Vermillion range in Minnesota, which shipped 450,000 tons last year, will be capable of producing 900,000 tons this year, though their owners believe it

would be inadvisable for them to undertake to make so large an increase in one season. Several of the Gogebic mines are in shape to enlarge their output quite considerably. Taking the entire region, a conservative estimate of the increase expected this year, if no positively unfavorable conditions develop in the iron trade, is about 10 per cent., or 500,000 tons. If a very active demand should spring up for ore, and manifest itself sufficiently early in the season, it is believed that the production of the year could be brought up to 6,000,000 tons. The greater proportion of this increase would be in non-Bessemer ores.

The remarkable fact, as previously demonstrated, that the consumption of Lake Superior ore last year was about 1,000,000 tons greater than the production, so that stocks at lower lake ports and at furnaces will be pretty well exhausted by the opening of navigation, causes the ore men to look forward to the placing of contracts for the coming season with a great deal of interest. The earlier the contracts are placed, the more definitely can the season's work at the mines be planned. If it is clearly established that considerably more ore will be needed than was mined last year, preparations can be made to meet the enlarged demand. From three to six months' notice is needed to get the mines in good shape to materially increase their output. Dead work would have to be done which is not now contemplated, and good-sized stock piles should be prepared by the time navigation opens. So far as shipping arrangements are concerned, the facilities for handling ore on the lakes are now better than they ever were. A very fine class of vessels is now employed in this trade, they are both loaded and unloaded with remarkable celerity, and their movements are controlled as systematically by the large ore shippers as railroad trains are governed by the dispatchers. Immense as is the tonnage of the ore mines, the shipping facilities keep pace with it. In Wisconsin and Illinois the railroads are gradually absorbing the ore business, but thus far only a few thousand tons have been hauled by rail from the Lake Superior mines to the furnaces in Ohio, the circumstances being so exceptional and the rates so high that the movement is not likely to grow until the conditions change very decidedly.

The ore men are anticipating lower vessel rates than those which prevailed at the close of last season, and may be able to secure charters at about the rates paid when the season opened. The mildness of the winter and the short wheat crop in the Northwest are expected to operate in their favor, together with the increased tonnage now in course of construction at the lake shipyards. The winter has been so open that the stocks of coal at the upper lake ports have diminished very little in comparison with previous years, and unless severe weather sets in soon the opening of spring will find stocks still large, with correspondingly less employment for lake vessels in that line. The Minneapolis flour mills are drawing heavily on the light stock of wheat in the Northwest, and are expected to require even the wheat in the Duluth elevators to meet their wants. With an increased number of vessels demanding employment, the new tonnage under construction, amounting to over 100,000 tons, it would appear that the ore men have good reason to look for a decline in freights. The vesselmen, however, are not yet prepared to accept the situation, and may hold out for some time against the pressure now being brought to bear on them.

The partnership heretofore forming the Teal Hoist Company, Limited, of Philadelphia, has been dissolved by mutual con-

sent. In the future the business—the manufacture of Teal's portable hoist—will be conducted under the firm name of the Maris Machine Company, which is composed of Frank Maris and Charles E. Maris, who have purchased the business, patents and fixtures of the original company.

Lubricating Oil in Bulk.

The attempts made a short time ago to transport Russian refined lubricating oil in bulk to Antwerp and other ports of Europe do not appear to have been very successful. Refined machinery oils depend for their reputation and sale upon their color, and, as the mere addition of a few drops of water will discolor a large quantity of oil, most of the consignments, if not all, had to be subjected to clearing processes afresh before they could be placed on the market. Possibly by extremely careful manipulation, and rendering the tank steamers absolutely water-tight it may be found possible in time to overcome the defect; but in the meanwhile an innovation respecting which so many sanguine expectations were expressed a short time ago appears to have dropped out of favor. At any rate the Shibajeff firm, which is the principal lubricating oil firm at Baku, has not adopted the new system, and still sends the whole of its large consignments of refined mineral oil in barrels. A good deal of dissatisfaction is expressed in Russia at the way sham or adulterated Russian lubricating oil is placed on the English market. The accusation is freely made that a large proportion of mineral oil sold in England as Russian is not Russian in the strict sense of the term at all, often consisting of simply a fraction of Russian oil mixed with sham mineral oils of vegetable origin. In this manner the high reputation given to Russian mineral oil by Mr. Boverton Redwood, Professor Sadler, and other experts, is not justified in the article sold, and an ill impression is created very annoying to the Baku firms. It is in order to avoid impairing this reputation that the Shibajeff firm have refused to send their oil to England in tank steamers, notwithstanding that they manufacture 8,000,000 gallons a year under the supervision of V. Ragozine, the founder of the mineral oil industry in Russia. All the same, seeing how many advantages would result from handling the oil in bulk, it ought not to be wholly impossible to devise some means whereby water can be totally excluded from the tanks during the overseas voyage. Every year the demand for machinery oils grows greater and greater, and the largeness of the sale will in time justify even costly attempts to overcome the difficulty at present attending their conveyance in bulk.

An examination tending to show the chemical union of lime and silica by long contact has been made by Mr. John Spiller, F. C. S., of England. A sample of ancient mortar was taken from the section of an old London wall recently laid bare in St. Martin's-le-Grand. From the fact that a large quantity (11 per cent.) of silica could be dissolved out readily by caustic soda, and there being a deficiency of carbonic acid without any evidence of free caustic lime, the inference was drawn that silicate of lime was present, this body being the result of direct combination between the lime and sand in the course of many centuries. Samples of a London mortar about 100 years old and another of recent date contained 1.1 per cent. or less of soluble silica—that is, only one-tenth of the amount now actually found in the Roman mortar analyzed.

The Pencoyd Twenty-five Ton Crane.

In the description of the Pencoyd Iron Works of A. & P. Roberts & Co., Pencoyd, Pa., published in *The Iron Age* of

were largely built there. The mast, which is 25 inches in diameter for a length of 14 feet 5 inches, is probably the heaviest forging in this country. The swing of the crane, as will be observed from the

tached to the mast, which has a diameter of 11 inches and 8-foot stroke, the rope running over the shears shown. The trolley is handled by a $6\frac{1}{2}$ -inch hydraulic cylinder, having a 12 $\frac{1}{2}$ -foot stroke. The

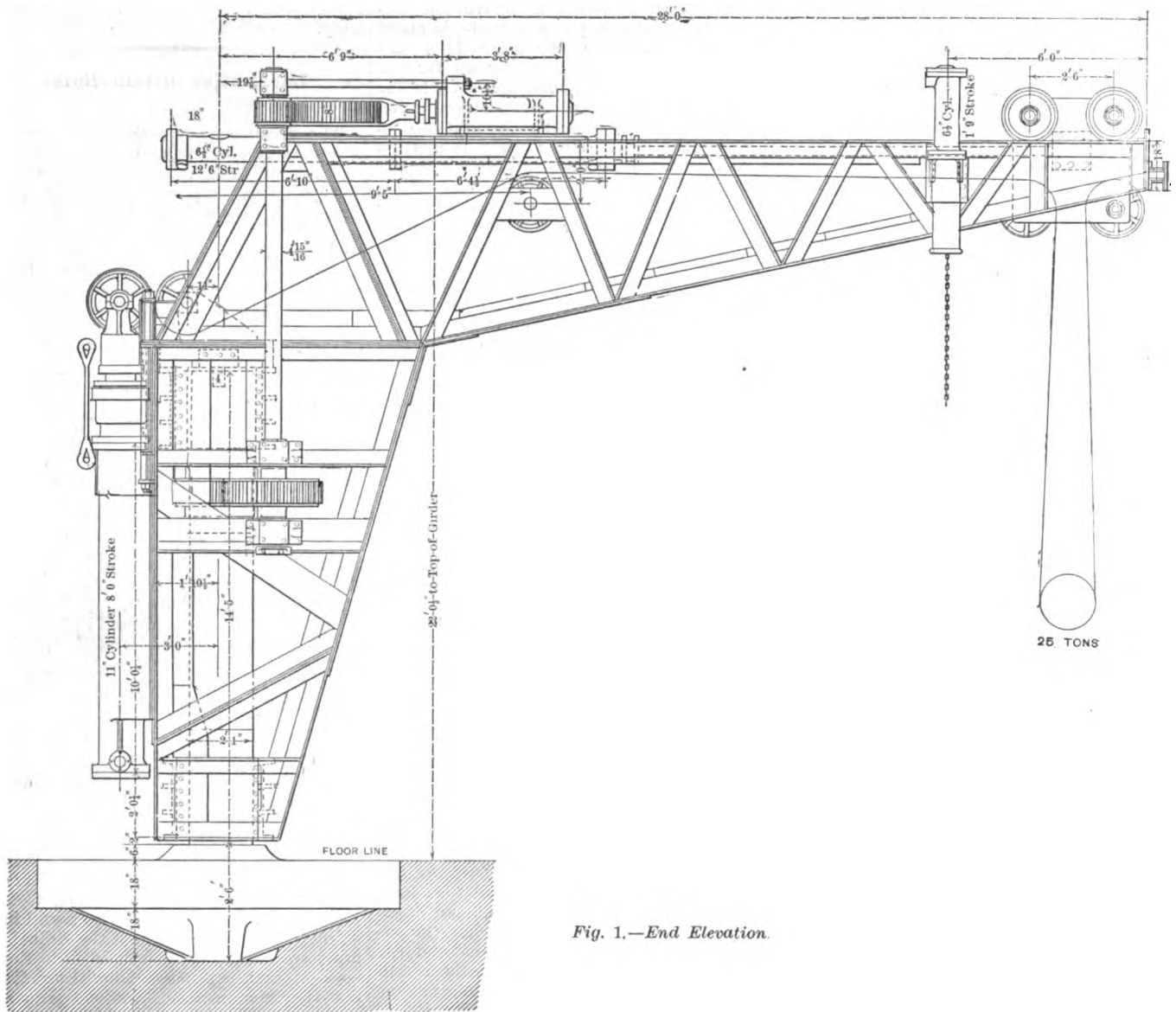


Fig. 1.—End Elevation.

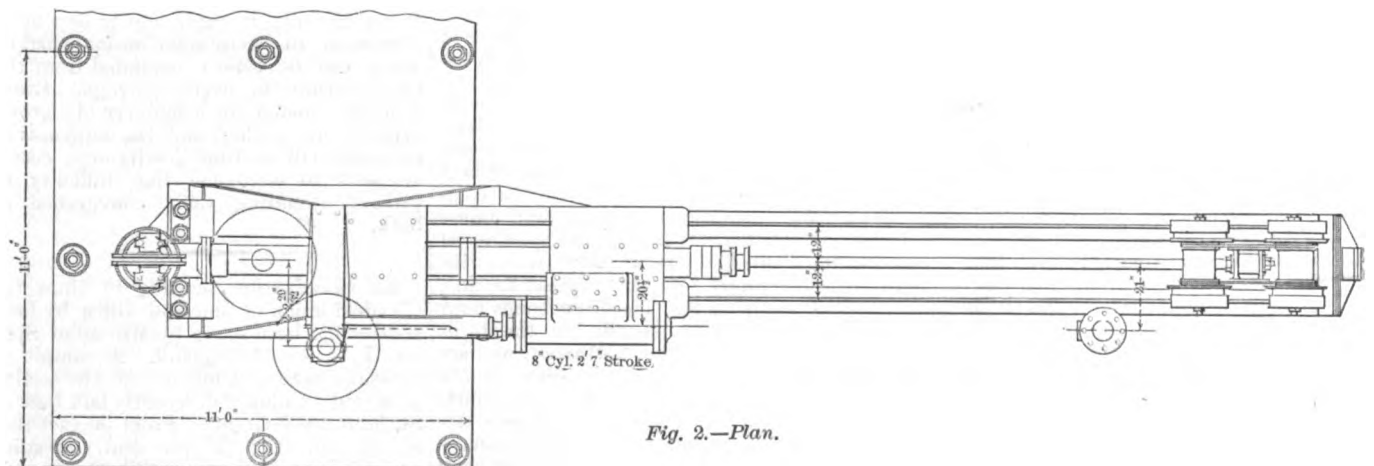


Fig. 2.—Plan.

TWENTY-FIVE TON CRANE.—A. & P. ROBERTS & CO., PENCOYD, PA.

December 27, 1888, page 966, we alluded briefly to the two cranes which serve the 20-ton hammers in the new hammer shop. These cranes, which can handle a load of 25 tons each, have been designed by the engineers of the Pencoyd Works, and

accompanying engravings, is 28 feet. It is swung by means of an 8-inch hydraulic cylinder, with 2 foot 7 inch stroke, the rack and pinion movement being transmitted, as shown. The load is handled by means of the hydraulic cylinder at-

total height of the crane from the floor line to the top of the girder is 22 feet. The working pressure for the hydraulic cylinders is 700 pounds. The works have built two of these cranes, one on each side of the large hammer.

The Standard Metal Cross-Tie.

The objections which have been made to the various forms of metallic railroad ties which have been tried are founded almost wholly upon the form of the tie itself and the method of fastening the rail to it. It is conceded by many leading railroad managers that a metal tie would be far preferable to one of wood, if it were designed so as to meet the essential requirements. The experience gained by studying the behavior of those ties which have been used more or less extensively in England, Germany and India has brought out the defects in the forms, and has indicated the characteristics which should be found in the perfect tie. When the rail rests in direct contact with the tie, there is invariably a certain space, caused by unequal expansion and contraction, through which it is free to vibrate. This greatly increases the noise, and produces crystallization. Wedging between the rail and tie does not overcome the difficulty. Wooden ties have a comparatively rough surface, with which the ballast engages in such a way as to firmly hold the tie in place. Metal ties, not having this feature, have a tendency to move laterally, the pressure of the train against the outer rail being sufficient to move the track. Attempts to remedy this defect have been made by downwardly curving or bending the ends of the tie to enable it to grip the ballast.

The steel tie of the Standard Metal Tie and Construction Company, of New York, which we herewith illustrate, appears to do away with these objections. The general form of the tie is clearly shown in the several drawings. In the channel of the tie is accurately fitted an oak block, the grain of which runs vertically. The block

ment is prevented by the upturned ends which encounter the ballast between the rails, where it is much more compact than at the ends of the ties.

No fish plates are required with this tie, as the rail joint is made over a broadertie, provided with two bolts, which pass through the clips instead of one; and in order to prevent the creeping of the rails a steel plate is used, which has four vertical lugs, one at each corner, arranged to engage notches formed in the rail base. That this tie and fastening are extremely simple in construction is apparent; it is also evident that the rail and tie are united with such force as to practically form one piece. Carnegie, Phipps & Co. have entered into a contract with the Standard Metal Tie and Construction Company to furnish the plates for the ties. The E. W. Bliss Company have furnished the presses for shaping the sheets.

First-Class Standard Track (January, 1884) with Gravel Ballast 12 Inches Under Wood Ties, \$1.54 Per Foot.

Rails at same cost as above.....	\$3,908.43
Cross ties " "	1,971.20
Joints " "	316.80
Spikes " "	181.02
3,000 cubic yards gravel @ 25¢.....	750.00
Labor.....	1,000.00

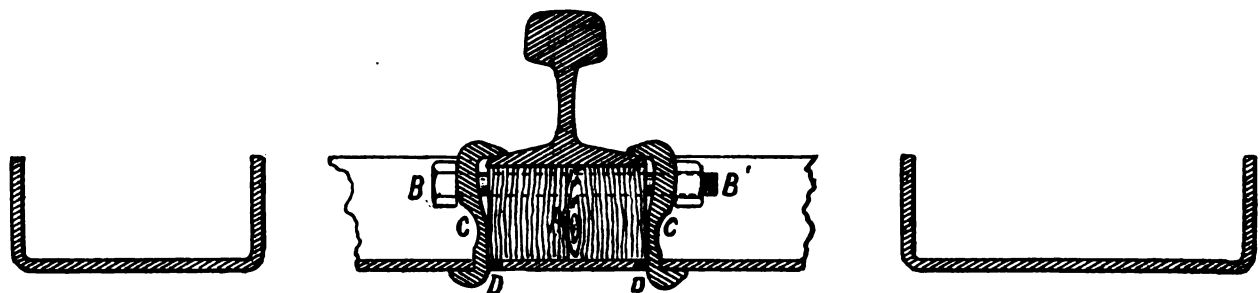
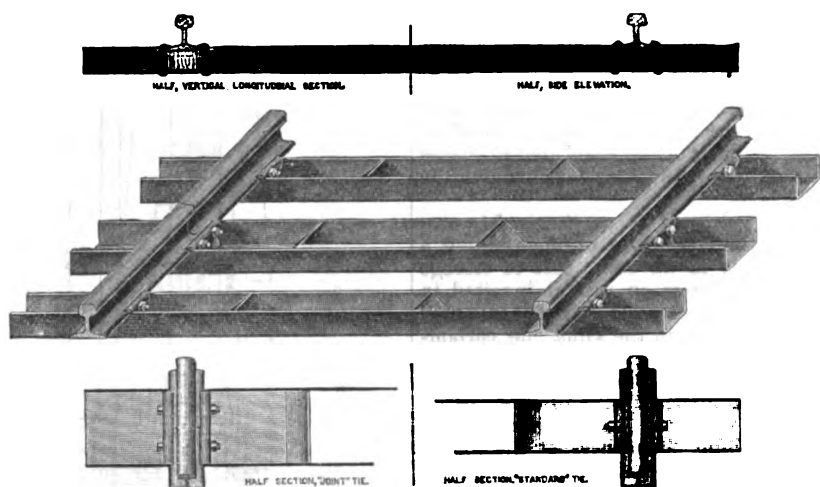
One mile \$8,122.45

First-Class Standard Track with Stone Ballast 12 Inches Under Standard Steel Ties, \$2.85 Per Foot.

Rails at same cost.....	\$3,908.43
2,464 Standard ties @ \$2.25 each.....	5,544.00
352 joint ties, complete with clips, bolts, nuts and blocks @ \$3 each....	1,056.00
Stone ballast at same cost.....	3,570.00
Labor reduced to.....	900.00

One mile..... \$14,978.43

Additional first-cost of one mile with Standard steel ties complete 3,230.98



STEEL RAILROAD TIES, MADE BY THE STANDARD METAL TIE AND CONSTRUCTION CO., OF NEW YORK.

is of the same width as the base of the rail, but is $\frac{1}{4}$ inch less in height than the depth of the channel. The sides of the channel are cut out under the rail about $\frac{1}{4}$ inch, to permit the rail to rest directly upon the wood. Through the bottom of the tie, at each side of the block, are cut two square holes, through which the lugs of the clips C hook. The upper end of the clip is beveled to correspond with the upper surface of the base of the rail, and its middle or body portion is curved inward, so that when the clips are drawn together by the bolt B they press against the sides of the block before closing down upon the rail. The blocks are tested under hydraulic pressure, and their durability is increased by creosoting. This arrangement of clips and bolt forms a secure fastening, which should prevent any movement of the rail. But should the rail become loose, a slight turn of the nut on the bolt would bring the jaws of the clips further over the rail and again firmly hold it.

The central portion of the bottom is cut out and the ends bent upward at an angle of about 45°. A separate bearing surface is thus formed under each rail, the weight is reduced, while the strength remains practically the same, and lateral move-

The following tables show the actual cost of a standard track having wooden ties and stone and gravel ballast, and the estimated cost of a similar track furnished with the Standard ties. The former figures were taken from the books of a trunk line in January, 1884, and are believed to be as low as it was possible to build a good track at that time. The percentage of the first cost of steel ties over wood would be less at the present time than that shown in the tables, owing to the increased weight of rail and the larger and heavier fish plates and larger ties needed. According to the tables the additional cost of steel over wooden ties is the same as the additional cost of stone over gravel ballast; hence it is possible to lay steel ties with gravel ballast at the same cost as wooden ties with stone ballast.

First-Class Standard Track with Stone Ballast 12 Inches Under Wood Ties, \$2.22 Per Foot.

108 3-7 tons 60-pound rails @ \$36.....	\$3,908.43
2,816 cross ties @ 70¢.....	1,971.20
352 joints @ 90¢.....	316.80
6,034 pounds spikes @ 3¢.....	181.02
3,400 cubic yards stone @ \$1.05.....	3,570.00
Labor.....	1,800.00

One mile..... \$11,742.45

First-Class Standard Track with Gravel Ballast 12 Inches Under Standard Steel Ties, \$2.22 Per Foot.

Rails at same cost as above.....	\$3,908.43
Standard ties " "	5,544.00
Joint " "	1,056.00
Gravel ballast.....	750.00
Labor reduced to.....	500.00

One mile..... \$11,758.43

The Standard Company calculate that their steel ties will last at least 40 years, and that a mile of track will cost \$6600. The cost of renewals in blocks, bolts and nuts is estimated at \$1689, making a total cost of \$8289. It is estimated that wooden ties, plates and spikes cost \$2469.02. Renewals necessary to meet the life of steel ties, taken as at 6 to 40, cost \$16,460.13. Labor at 30 cents per tie, and five and a half renewals during the period, \$4646.40. This makes the total cost of wooden ties for 40 years \$21,106.53, and shows a saving per mile in favor of steel of \$12,817.53.

In 1887 Norway imported metals to the value of £537,000, of which £276,000 was in raw or half worked metals, and £182,000 in iron plates. Machinery to the value of £110,000 was imported.

Improved 10-Inch Shaping Machine.

The accompanying illustration represents an improved 10-inch shaping machine, built by Boynton & Plummer, of Worcester, Mass. This machine, being on a pedestal, admits the placing of long work in front, for which there is provided a face plate for attaching such work as legs of machines, &c., to, and to which may also be attached an angle plate, either in a right or left-hand position and at any angle with the face plate, thereby enabling the planing of any angle or bevel required. The feed is automatic and reversible, and the cutter bar has a graduated swivel head. Through the body of the machine, directly under the tool, is a large open space which permits the placing of long work,

present population is 1,400,000, many of the counties having doubled and even trebled in population during the past year. The value of the mineral products in 1888 is placed at \$20,000,000; manufactured products, \$170,000,000; orchard products, \$24,000,000; cereal crops, \$55,000,000.

The Friction of Locomotive Slide Valves.

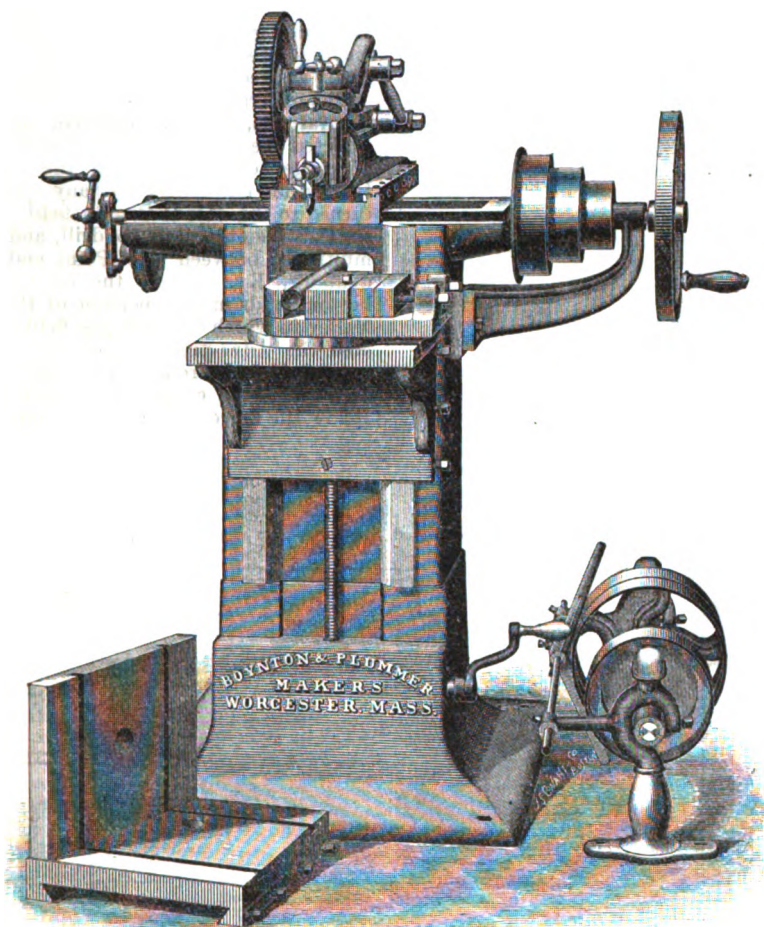
At a recent meeting of the British Institution of Civil Engineers a paper was read on "The Friction of Locomotive Slide Valves," by Mr. J. A. F. Aspinall, M. Inst. C.E.

In this communication the author stated that only scanty data existed as to the

relation between the pull or the push on the valve and the pressures recorded by the indicator could be expressed by a simple linear equation:

$$L_i = 5.61 + 1.26 L,$$

where L_i was the pressure due to the force required to move the valve, and L the pressure shown by the indicator. The results of experiments with the apparatus on an ordinary brass valve, a brass Allen valve and a cast-iron valve were then given, both with the link in full forward gear, and with the link notched up. A small excess of the pushing pressures over the pulling pressures was shown to be due to the steam pressure on the back end of the spindle. Samples of the diagrams and calculations were submitted. As the valve resistance was not uniform throughout the stroke the causes of variation were discussed. These were the variation of pressure on the back of the valve, the variation of pressure on the face of the valve, the variation of pressure in the exhaust space, and the inertia of the parts in motion. As the most convenient measure of the valve resistance the author took, not the mean resistance of the valve, but the resistance at mid-stroke, and he compared his resistance with the few experiments previously made. The author's results made the valve resistance considerably less than it had been supposed from previous experiments. He found the resistance of a valve in motion, with 127 to 139 pounds pressure on the back, to range from 982 to 1321 pounds. The valve was $16\frac{1}{2} \times 10$ inches. Taking one case, the total load on the back of the valve was 22,110 pounds; the relieving pressure on one steam port, 1800 pounds; the relief due to steam in the valve passage, 980 pounds, and the relief pressure on the exhaust area, zero. Hence the resultant load was 19,330 pounds. The force necessary to move the valve was 1321 pounds; the coefficient of friction was therefore 0.068. Similar calculations for two other valves gave coefficients of friction of 0.054 and 0.051. The lowness of the coefficient was remarkable, especially as the temperature of the surfaces must be about 350° F. The author calculated the percentage of power lost in slide valve friction at 1.34 to 2.26.



IMPROVED 10-INCH SHAPING MACHINE, BUILT BY BOYNTON & PLUMMER, WORCESTER, MASS.

such as shafts for key seating, &c. The table is adjusted by means of a crank at the side. Although the machine is rated as having a stroke of 10 inches, it will make a stroke of $10\frac{1}{2}$ inches, and can be adjusted to any less distance. With the machine is furnished a swivel chuck and also a plain chuck taking work the full length of traverse; the former may be fastened to either the face plate or angle plate. The head, or ram, has a horizontal traverse of 15 inches. The vertical traverse of the table is 18 inches. The swing shafts and feed-screws are made of the best steel, and the screws and other parts are case hardened where necessary. The weight is about 1000 pounds. These machines are especially suitable for model-makers, die-sinkers, railroad repair and other shops, because of the accurate work they will do. The manufacturers also make 6 and 8-inch shaping machines.

San Francisco papers claim that the past year was the most prosperous in the history of California. It is estimated that the

friction of slide valves, and that the few experiments which had been made were not of a very satisfactory character. Hence he was led to design an apparatus for graphically recording the force required to move slide valves during the whole of their travel. The apparatus consisted of a small hydraulic cylinder and piston, which was made to form part of the valve link. An ordinary steam-engine indicator was screwed on to one end of this cylinder, and an air valve was placed on the other. For pulling, the indicator was on one end of the hydraulic cylinder. For pushing, it was placed on the other end. A second indicator on the valve chest gave a simultaneous diagram of the pressures on the back of the valve. The pressure on one side of the hydraulic piston being atmospheric pressure, that shown by the indicator at the other end was the force required to move the slide valves, less any friction of the apparatus. The author described the experiments made to determine the friction. The results showed that the

Behavior of Tempered Steel.—B. Pensky, after experimenting with two steel rods 100 mm. in length, observed that they exhibited an increase in volume after they had been tempered by heating to redness and plunging in water. *Industries* reports that he attributes this to the fact that the external layers solidify first, and consequently prevent to a certain extent the contraction of the interior mass during cooling. The length of the rods under these circumstances showed a variable behavior, inasmuch as one of the rods, 27 mm. thick, increased in length 0.083 mm., while the other, 13.5 mm. thick, decreased in length 0.080 mm. It would thus seem that a rod when tempered becomes longer or shorter according as the proportion of surface to volume is either below or above a certain limit. Subsequent to the tempering both rods became gradually shorter at the ordinary temperature, the decrease in length amounting to 0.032 mm. and 0.021 mm. respectively. When they were now heated to 120° they underwent a further diminution in length amounting to 0.015 mm. and 0.021 mm.; but further exposure to the same temperature produced no alteration in the length. On the other hand, by subjecting the rods to successively rising temperatures continued shortening was observed. Very hard steel disks suffered similar decrease in the length of their diameter, gradually at ordinary temperature, but more rapidly after being heated.

Foreign Intrigues in Corea.

A Russian treaty with Corea, just negotiated, ostensibly for the promotion of trade on the Northern frontier, excites suspicion of an ulterior object; and the agency which Mr. Denny, "the smooth-tongued American" who acts as the king's adviser, is supposed to have had in the matter, opens more widely the field of conjecture. It concerns the United States, as the leading power in opening Corea to commerce, and as being the first to accept her foreign ambassadors, to learn through what influences the plans for Corea's commercial development under the treaty negotiated through Admiral Schufeldt in 1882 have been so effectually thwarted. China, it is well known, has resolutely refused to recognize Corea except as a vassal state, and she insists on maintaining at the Chinese legation at Seoul a military mandarin, who is accused of arrogating to himself the direction of Corean affairs in a sense that conflicts with the special prerogatives of the king, thereby exciting the fierce antagonism of Mr. Denny, who, at the same time, professes a desire to conciliate the high authorities at Peking. The relations of the king's adviser are so equivocal that he is openly charged by the *Japan Gazette* with pursuing a traitorous policy, and from another source comes the intimation that he would, in an emergency, favor an alliance with Russia.

The commercial treaty referred to was concluded early in August last, securing for Russian subjects the priv-

in the future of Corea, whose wealth of gold, as yet undeveloped, and valuable woods will constitute important articles of commerce. Altogether Corean affairs are badly mixed. Between the intrigues of Russia and China the arts of diplomacy will have an ample field, and the so-called "adviser" may find himself seriously perplexed.

New Engine Valve.

We show on this page several illustrations of a new form of engine valve brought out by the Chickasaw Iron Works, of Memphis, Tenn. Its design and function will be readily understood, the plan and

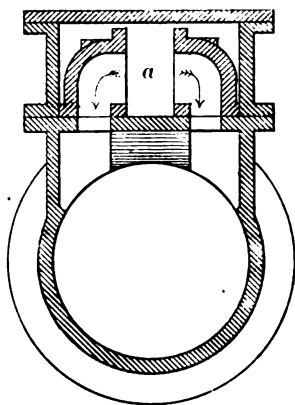


Fig. 1.—Transverse Section.

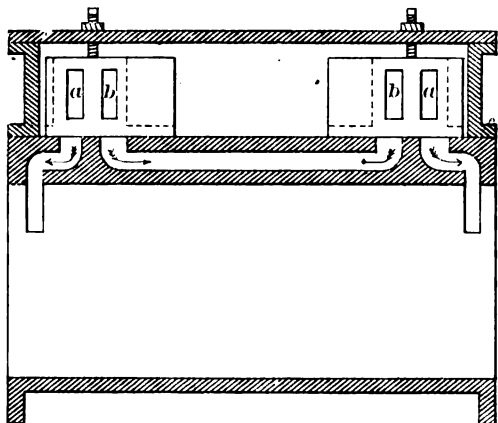


Fig. 2.—Vertical Longitudinal Section.

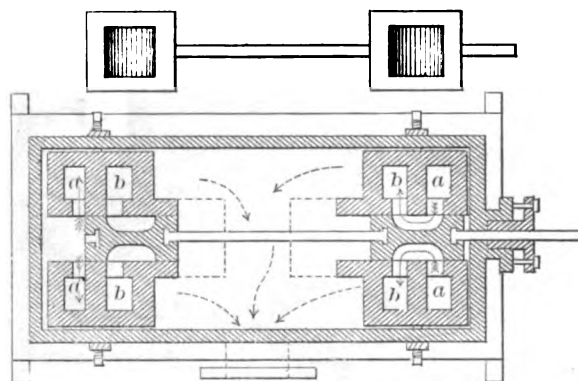


Fig. 3.—Sectional Plan.

NEW ENGINE VALVE, DESIGNED BY THE CHICKASAW IRON WORKS, MEMPHIS, TENN.

ilege of trading direct with Seoul through certain open ports. All Russian diplomatists and officials shall be free to travel in any part of Corea. On the other hand, Corean subjects shall be allowed to travel in Russia for pleasure or trade. The Corean Government shall permit the construction of factories by Russians in all places, and it will not be permissible for any obstructions to be made in future. Stringent customs rules are provided. All controversies in Corea between Russian subjects and subjects of other Powers shall be settled by the Russian officers without interference from the Corean Government. Actions against Coreans brought by the Russian authorities in Corea shall be decided according to Corean law by Coreans. The treaty is to remain in effect five years. The statement on London authority that Russia had declared a protectorate over Corea Mr. Denny pronounces a fabrication, as the treaty "gives no privileges to Russia from which other countries are to be excluded." Mr. Denny expresses himself as being a firm believer

sections requiring little explanation. It will be observed that the steam chest is of the ordinary design. Within it, however, at each end or in the middle, steam chambers with vertical and horizontal faces are provided. The latter rest on the bottom of the steam chest, while the former constitute a passage-way in which the valve travels. The arrows in Fig. 3 indicate the direction of flow of the steam, the ports *a a* serving for admission and the ports *b b* for exhaust. The valve, we need perhaps scarcely add, is practically balanced, and appears to have been introduced with good results.

The contract for the construction of the Merchants' Bridge across the Mississippi at St. Louis has been awarded to the Union Bridge Company, of New York City. The bid in gross for the building of the bridge only and for what iron work is specified for in the approaches is \$1,200,000. According to the charter agreement, work must be begun by February 2, or a forfeiture to the United States is the result.

Natural Gas at Louisville.

Prof. Edward Orton, State Geologist of Ohio, has submitted to J. R. Proctor, State Geologist of Kentucky, a preliminary report on the natural gas territory in Meade County, Ky., tributary to Louisville, the distance from the center of the gas field to the city being 27 miles, the pipe line having a length of 80 miles.

In the early days of the oil excitement the existence of traces of oil in the vicinity of Brandenburg, Ky., near the Ohio River, led to the drilling of a number of wells, of which several showed considerable quantities of gas and brine. One of them, on the Moreman farm, flowed without restraint until 1872, when the Moreman Salt Works were established, the associated gas being utilized as fuel in the manufacture of salt. The works, though small, proved exceptionally profitable.

The general recognition of the value of natural gas, so long delayed, naturally directed the search for it to the localities of earlier discoveries, and the cities of Louisville and New Albany naturally turned to the Meade County field. Companies were organized to drill, and wells multiplied between West Point and Brandenburg, Ky. From the level of the bottom lands in that portion of the Ohio Valley in which the new gas field is situated the drive-pipe of the new wells is quite uniformly from 100 to 125 feet, in valley deposits of clay, sand and gravel. Below the drive-pipe a series of limestones,

shales and possibly shaly sandstones is struck, which continue for 100 to 300 feet, and this in turn is followed by about 100 feet of soft, blue shale, called soapstone, or sometimes "mud-rock," by the driller. In the upper beds of this soapstone the casing of the wells is usually set. The soapstone is in turn underlaid by a bed of black shale, 50 to 100 feet in thickness, and this is the main gas rock and also the source of the salt water of this district.

The Meade County field constitutes a remarkable exception to conclusions held for a long time and which seem established on a sufficiently wide induction. The Meade County gas horizon is not like the Findlay gas rock, a newcomer in the field. The Ohio shale, under its various names, has been as long and as well known in connection with natural gas as any other strata in our entire series. Along its outcrops in Western New York, on the shores of Lake Erie, the gas springs that issue from it have been known since the region was first occupied by civilized men. The utilization of the gas

in this region goes back, in fact, to the first quarter of the present century. Since these earlier examples of successful use, wells have been drilled by the hundred, along the lake shore and in contiguous territory, expressly in the search for gas for household use. There is scarcely a mile, and certainly not a single township, along the line of the outcrop of this formation, from Silver Creek in New York to Huron River in Ohio, in which wells have not been drilled for gas. In many towns and villages a large and conspicuous service has been rendered by these wells. Erie, Pa., and, in Ohio, Conneaut, Ashtabula, Painesville and Cleveland may all be named as examples of this successful use. Throughout the entire district, success in drilling these wells has been the rule, and failure the comparatively rare exception.

After this wide and long-continued experience in the gas production of the Ohio shale, the geologist certainly felt warranted in deducing the laws and characteristics of this production. The characteristics are easy to define. The gas is of the Pennsylvania type, free from the sulphurous compound of limestone gas; it is low-pressure gas—or, in other words, it is not reservoir gas; it is not closely associated in production with salt water in the rocks. The shale sometimes contains salt water, it is true, but the gas is not delivered by the pressure of a water column. Such pressure is presumably the cause of the flow of high pressure or reservoir gas. The shale is practically an impervious rock. The pressure of the shale gas never exceeds 100 pounds to the square inch, and is generally limited from 10 to 30 pounds to the square inch—the daily yield of shale gas wells is consequently small. A production of 100,000 cubic feet per day is usual. The wells already described are mainly limited to less than 10,000, or to even less than 5000, cubic feet per day. This small production and the absence of an aggressive water column in the rock from which the gas is drawn give to these wells their long lives. Deductions drawn from these low-pressure wells are not applicable, unmodified, to high-pressure wells. The former may last for centuries where the latter would exhaust themselves in decades, or even in a single year. The Fredonia wells, so often quoted as proving the permanence of natural gas, were yielding in their best days 1500 to 3000 cubic feet per day, and deeper drilling has not permanently enlarged the supply. The use of torpedoes in these shale wells has not as a rule been successful. There is no way known of enlarging the flow or increasing the pressure of this group of wells. We must take them for what they are, and apply them to what seems their proper use—viz.: the furnishing of light and heat for domestic use.

The gas of the shale wells appears to be indigenous—that is, it is derived from the rock in which it is generated. The supply may be maintained by a slow conversion of the oil with which the shales are charged into gas. But there is nothing to indicate that the total amount of petroliferous contents in the shales has been increased since they were originally deposited. These conclusions in regard to shale-gas production seemed, as before stated, to be established on a sure foundation, and the geologist might well feel warranted in predicting what the behavior of the formation as a gas-rock would be, in any new locality in which it should occur.

The Meade County gas is unmistakably derived from the black shale, and it agrees with such an origin in chemical composition. But all of the other more important conclusions, that we have drawn in regard to the characteristics of shale gas, are promptly set aside by the new experience. The Meade County gas is reservoir or

high-pressure gas. It is associated with, and driven by a salt-water column. Its wells reach a maximum production of 2,000,000 cubic feet per day. They are greatly improved by the use of torpedoes. The rock pressure is low, it is true; but this evidently results from the shallow depth to which the gas-rock is found, for the depth is always a function of the rock pressure in reservoir wells. In the heart of the new field the rock pressure ranges from 100 to 125 pounds per square inch, the depth of the wells ranging from 300 to 500 feet below the surface. Again, the gas wells of this district produce salt water freely in connection with the gas, without, in all cases, at least, being over-run by it.

All this is confusing to a high degree. It seems at first sight as if such an experience destroyed all possibilities of scientific or practical provision in the search which our cities and towns are so eagerly pressing. But a closer examination shows us that but a single change has occurred in the character of the shale. Through the accidents of its history it has become a porous rock, and, consequently, a reservoir for gas, oil and salt water. All the other changes above noted follow at once upon the transformation of the shale from an approximately impervious rock to a porous rock.

PROVING THE FIELD.

The history of the first well of the new development has been already given in a preceding section. A daily flow of 800,000 cubic feet of dry gas was obtained from the well known as the Major Davis well, or well No. 1 of the Union Gas Company. This company has since drilled three other wells in the immediate neighborhood, one of which is unproductive, but the remaining two of which agree with the first in general character. The total production of the three wells is 2,500,000 cubic feet per day. The Kentucky Rock Gas Company next came into the field, having secured drilling privileges for a large acreage on the Kentucky side of the river, directly opposite the low arch which Major Davis had already discovered in the Indian hills. A number of wells have since that time been drilled by the company, on the Fountain, McGehee, Bickerstaff, and other farms in this immediate district, and it is this group of wells that mainly give character to the field.

The first well to be drilled by this company was the one known as the Bickerstaff well No. 1. It found the shale at a depth of 886 feet, and gas was found in good volume at 892 feet. The well was completed in January of the present year, and was allowed to burn without check until March, when it was shut in. On being opened a few weeks thereafter it was found to contain salt water. The water gained rapidly upon the gas, greatly reducing its flow. This is a type of several wells that have been drilled within the limits of the company. In some, indeed, the salt water makes the conspicuous feature of the production.

Another and better type is represented in the Bickerstaff well No. 2. In this the shale was found at 342 feet and gas in large volume at 368 feet. The well was torpedoed with 45 pounds of dynamite of 75 per cent. strength, and the flow of gas was greatly increased thereby. The gas proves to be entirely dry, and its production exceeds 2,000,000 cubic feet per day.

The First National Gas Company's expenditures and tests, in the search for natural gas, have been made a few miles up the river. They have found gas in excellent volume, in several wells, but in all cases it has been associated with salt water, at least after the wells have flowed for a few weeks. The original production of the Smith well, in this series, is represented to have been as vigorous as

any yet found in the valley. The well drilled at West Point, by Messrs. Cox & Montgomery, produced salt water and gas, the latter in comparatively small amount. The statements given above suffice to show that the black shale, when dripping from its outcrop, at New Albany, to a depth of 300 to 500 feet in the Ohio Valley, becomes, under certain conditions, a reservoir of natural gas and salt water on a large scale. Can its contents be made available for use? In other words, what is

THE VALUE OF THE FIELD?

In answering this question we are obliged to bear in mind that the Meade County field stands by itself in several important particulars. There is nothing, so far as I know, in the records of gas production that is exactly comparable with it. In the first place it is peculiar from the large production of its wells, when taken in connection with their shallow depth and their consequent low rock pressure. In the second place, it is peculiar because of the almost constant association with the gas of salt water of fair strength and exceptional purity. Up to a very recent date the presence of salt water has been counted so unfavorable to the flow of gas that fields are promptly condemned by the appearance of this last-named element in them. In the usual reservoir rocks it is counted certain that the salt water, if it once finds access to them, will steadily gain upon the gas and overpower it at last unless kept down by unremitting care.

In default of like experience in other fields, we are obliged to use the experience that has been acquired in this. The Moreman well will furnish us our best example. As already stated, it has been steadily producing gas and salt water since 1863. Since 1872 salt manufacture has been going on continuously at the works. But salt manufacture is not the end for which the present development is going forward. It is natural gas which is in demand. What is the promise of the new field, as seen in the light of the Moreman well, in this respect? Through the courtesy of the proprietor, I had an opportunity, in August last, to measure the volume of the original well. I found its daily flow to be but little less than 200,000 cubic feet. It is not at all probable that the original flow has been maintained throughout all these years without diminution. But, assuming that it has been 200,000 cubic feet per day, What is the total volume of gas to be credited to this little drill hole? The calculation shows it to be 1,825,000,000 cubic feet. We are certainly warranted in enlarging the amount to cover the diminution of the well to a total of 2,000,000,000 cubic feet. What value would this amount yield at a rate of 10 cents per 1000 feet? On this basis the gas that has flowed out of the Moreman well would be worth \$200,000. It is the extreme vitality of the Moreman well that has impressed me most favorably in my study of the field.

The failing supply of gas in the Eastern fields has led the pipe line companies, that are operating there, to devise means for separating the salt water that invades the reservoir as the gas is withdrawn from it, and also to devise means for restoring or supplementing the declining rock pressure. This system can be introduced at once into the Meade County field, and thus be made to aid very greatly in its development. I take it there is no longer a question as to the practicability of separating gas and water when produced by a single well; and also of sending the gas forward to its destination with any required pressure, if only the gas is at hand. In default of this experience, the new field would appear in a very different light from that in which we can now regard it.

HOW LONG WILL THE FIELD HOLD OUT?

No one duly acquainted with the history of gas and oil production, in this country and elsewhere, can for a moment doubt that, in all their usual occurrences, they are forms of stored power. There are no forces in operation that will ever refill the reservoirs which the driller exhausts. Least of all has nature the power to meet, with her slow and patient method of working, the rapid depletions which our modern engineering skill can effect. The renewals of nature are adequate to the maintenance, for long periods, of the weak outflows of gas and oil which we call "surface indications," but beyond this they cannot go.

The bituminous matter, including gas and oil, of the black shale of Central Kentucky, and also the salt water that is found associated with the gas, are, in my opinion, undoubtedly stored products. The amount of them now existing in the shale is practically all that there ever will be. If brought to the surface on a large scale the salt water will gradually lose its strength, being replaced by fresh water that will follow it from the outcrops of the formation, and, in like manner, the volume and pressure of the gas will presently decline, as wells are multiplied.

Is there enough gas in this great reservoir to justify the large expenditure that a pipe line from the gas field to Louisville requires? It is obvious, I reply, that a few billion feet of gas, brought to the Louisville market, will suffice to return the capital invested in the entire plant, and also to duly reward the enterprising company that is solving the problem of making demand and supply meet, so far as this much coveted fuel is concerned. The gentlemen who are engaged in the work have looked intelligently at all the available facts, and they have satisfied themselves that they occupy safe ground. This gas field, as already shown, stands by itself in several important particulars, and must make its own history.

Universal Milling Machine.

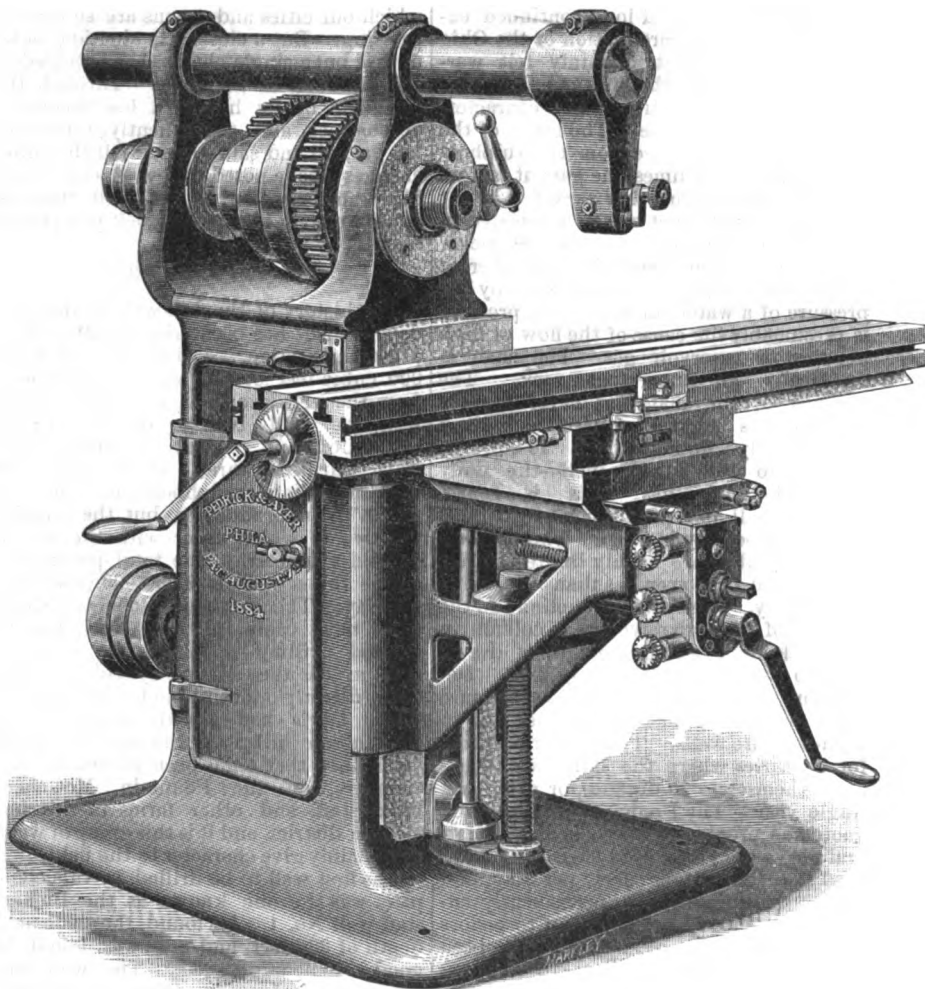
This machine has all the good points of the heavy Universal milling machine built by Pedrick & Ayer, of Philadelphia, although it does not, of course, admit of the latter's great range of work, but for its size and weight it has a greater range. It is designed for boring, drilling, forcing, milling, profiling, key seating, cotter drilling, rack cutting (any length), gear cutting, &c., and will make a valuable shop machine on delicate and accurate work. The spindle is of extra quality hammered cast steel and runs in bronze boxes, having an adjustment by which the original centers are always maintained without altering their position laterally—an important point, as the journal and bearings wear always in the same place. The front bearing is 3 inches in diameter and 4½ inches long; the back bearing is 2 inches in diameter and 4 inches long. The cutter arbor supporting bar, with its adjustable center, can be moved out to support the cutter arbors from the end of the spindle, or pushed back out of the way. This construction facilitates the milling or boring of a large piece of work that would be prevented by the ordinary fixed bar. It is 3¼ inches in diameter and of solid cast steel, making a very rigid support. The bar is provided with a harness to fasten to the knee of the machine when large centers are used and on extra heavy work.

The three feeds—vertical, horizontal (in line with the spindle) and transverse (at right angles to the spindle)—are all reversible, and are operated or stopped altogether by the handle shown in the engraving near the cup-board board. The

reversing device is common to engine lathes, does away with the crossing of belts and saves time. The three-step cone on the spindle belts to the lower cone, the shaft of which runs in a hollow stud and drives, by means of the reversing device referred to above, a shaft running through the base of the column. Bevel gears connect this shaft with the vertical shaft, and the latter by bevel gears with the horizontal shaft in the knee, which communicates in turn with the several screws for the various feeds in the front of the knee by clutch gears. These clutch gears can be engaged or disengaged at will by the knurled knobs shown in front, giving a vertical or horizontal feed. The platen feed is operated from the upper shaft in

desired, and is driven by a 3-inch bolt on a 4-step cone, the largest diameter of which is 11 inches. The internal gearing is 4 to 1 and the external 8 to 1. The dials read in decimals, or divided by 2, 4, 8, &c., enabling any measurement to be made.

The Pittsburgh Exposition.—The present outlook for the holding of an exposition in the city of Pittsburgh during the present year is indeed gloomy, and the lack of interest shown by the citizens and business interests of that city in the project is surprising. The annual meeting of the Western Pennsylvania Exposition Society was held on Tuesday, the 8th inst., during which the president of



NO. 1 UNIVERSAL MILLING MACHINE, BUILT BY PEDRICK & AYER, PHILADELPHIA, PA.

the knee by means of a pair of miter wheels running in a bearing which is a part of the platen slide on the knee. A vertical stud passes upward to the long screw in the platen, and is connected to it by clutch miter wheels. The screw in the platen is splined, and can be engaged and disengaged by a clutch lever, shown in the cut, convenient to the operator.

The platen is 48 inches long, 9¼ inches wide and has two slots on top for ¾-inch bolts and two slots on the edges. The latter are very useful and convenient. The platen has a transverse feed of 33¼ inches and a horizontal feed of 7½ inches. It can be turned completely round and fed in line with the spindle. It has an automatic stop while feeding in either direction, and is secured by four ¾-inch steel bolts in the swivel base, of easy access with a wrench. The knee is so designed and constructed as to withstand all strains liable to be brought upon it. The gearing is made either internal or external as

the society stated that the main building was nearly half completed, and that in order to complete it the sum of \$108,303 would have to be raised in a very short time, and unless this is done it will be impossible to have the buildings completed in time to hold an exposition during this year, as was the original intention. As is well known, Pittsburgh is one of the wealthiest, if not the wealthiest, cities of its size in the country, but it would seem as though its citizens had not sufficient faith in the benefits to be derived from an exposition to be willing to contribute toward its expense. It is announced that a mass meeting of the citizens will be held at an early date, for the purpose of increasing public interest in the enterprise, if possible.

Sheffield, England, exported cutlery to the United States in the year 1888 to the value of \$1,077,000, showing a slight gain on the previous year.

THE WEEK.

The *Mexican Financier* claims to have information that President Harrison will urge the immediate passage of an enabling act to carry into effect the pending reciprocity treaty between the United States and Mexico.

The New York City tax assessment books for 1889 show a real estate valuation of \$1,884,785,866, a net increase over last year of nearly \$82,000,000. Heavier taxes this year are predicted.

Tri-weekly vestibule trains will run from New Orleans to the City of Mexico, beginning on the 27th inst.

A report from Findlay, Ohio, says more than half of the oil fields of the State have been purchased by the Standard Oil Company, that \$1,500,000 have been paid by them for oil lands since December 1, and at the present rate of absorption this corporation will own the whole before spring.

The Hebrew Technical School in this city is flourishing. It now has 122 pupils, an increase of 22 over last year.

Somerville P. Tuck, the Assistant Commissioner General of the United States to the Paris Exposition of 1889, says that applications for space for exhibiting already number 750 and are from all parts of the country, comprising all industries, arts, &c. Much more space has been applied for than can possibly be allotted to American exhibitors. The United States Commission intends to forward, besides an exhibit of the working of its departments, a display of the various objects contained in its bureaus and museums—such as specimens from the collections and apparatus of our Patent Office, Hydrographic Office, Smithsonian Institution, National Museum, Coast Survey, Fish Commission, Life Saving Service, Lighthouse Board, Bureau of Engraving and Printing, Geological Survey, &c.

Germany is becoming excited on account of alleged American interference in Samoa and she is no less troubled by the active resistance of African slave-traders to her schemes for traffic on the coast of Zanzibar.

Shipments of sugar machinery from New York to Cuba and Mexico are the largest ever known. Hardware, locomotives and miscellaneous railroad materials are also going out freely.

The Haytian Minister Preston in New York City fiercely denounces the Dominican Consul Julia for his purchase of a menhaden steamer to be converted, it is alleged, into a man-of-war, for the use of one of the hostile factions in the Haytian Republic. The money, it is charged, was furnished by Jimenes, a wealthy merchant of Cape Haytien, a relative of Hippolyte, and virtually in control of the Dominican Government. A war with San Domingo is said to be in prospect.

A distinguished citizen of East India, who represents an influential educational society there, is now in the United States to secure competent skilled workmen to return with him and establish schools for instruction in the best methods of manufacturing iron, glass, and the various metals, as well as in mechanical engineering. A part of his plan is to secure admission for a number of young men into American workshops and factories as apprentices. Other young men will enter our colleges and universities. Dr. Pepper, of the University of Pennsylvania, has interested himself to promote these objects.

An assuring fact bearing upon the maintenance of American steamship lines is the prosperous condition of the United States

and Brazilian Steamship Company. Only a short time ago the line was losing money so rapidly that there was a serious intention of abandoning it. Circumstances have so far changed that the organization does not now owe a dollar and soon expects to declare a dividend.

The Russian budget for 1889 shows a considerable surplus, which the Minister of Finance declares is due to the "sincerely pacific policy of the Czar."

Mayor Chapin, of Brooklyn, wants to spend nearly \$8,000,000, including \$1,500,000 for the purchase of property adjoining the new municipal building, and large amounts for new sewers and paving.

Wharton Barker, who was said to have obtained valuable concessions from China, is now defending himself in court against the impecunious claims of his protégé, the Count Mitkiewicz.

According to the *Chicago Tribune's* figures, the lowest cost of getting cattle ready for market is 24 cents per pound. "An average bullock weighing 1000 pounds costs the producer \$25. He is sold for \$30, which gives the raiser 20 per cent. profit. After passing through the slaughter-house, his hide, meat, tallow, &c., are sold for \$37, a profit of 23 per cent. Then the retailer takes the 500 pounds of dressed meat for \$30. He gets 18 cents a pound for choice cuts and an average of 7 for the rest, making a total of \$48.75, an advance of more than 60 per cent."

The cyclone that swept through the country last week wrought great destruction. The most serious calamity befel Reading, Pa., where a silk factory was prostrated and about 30 persons, mostly young girls, were buried in the ruins and 18 killed outright. The loss financially was computed at \$110,000. The fact that the mill was heated by steam and lighted by electricity alone averted a frightful conflagration, with the most deplorable consequences. Another disaster occurred almost simultaneously in Pittsburgh, where Welden & Co.'s building was thrown down by the united force of the wind and falling walls, crushing 14 persons to death. The walls adjacent had been freshly laid, and several carpenters at work on the structure are among the victims. The Fort Pitt Foundry also suffered, and much damage was done to the Mount Penn Stove Works. At the nail mill in Sunbury two stacks were blown on the roof and several were seriously wounded, two of them fatally. In Brooklyn two large gas tanks exploded, the force of the wind having caused them to careen, and the escaping gas ignited from a street lamp. The company's loss is \$80,000. The Navy Yard barracks were damaged to the extent of \$10,000. At Staten Island the chemical works were destroyed.

The managers of the New York Mercantile Library have decided to erect a new building on the present site in Astor Place, to be of iron, brick and terra cotta, and practically fire-proof. The estimated cost is about \$250,000.

A dispatch from Queenstown says that the Cunard Line steamer Umbria, which left this port on January 5, passed Brow Head at 5 p. m. on Friday, making the passage in six days, two hours and forty-five minutes and beating the best previous eastern record, which was six days, four hours and forty minutes, and was made by the Etruria in April, 1888.

An appeal will be taken from Judge Barrett's decision in the Sugar Trust case to a higher court, and John E. Parsons, of counsel for the trust, states that the Lord Chief Justice of England has come to an exactly opposite conclusion in a case which

he thinks cannot be distinguished from this. The New York Court of Appeals has made a very recent decision, which, he says, is significant of what he believes will be the ultimate decision here. Mr. Parsons adds that about the only effect of the decision, provided it stands and is applied to other cases, will be to increase prices by placing impediments in the way of trade. F. B. Thurber thinks that more importance is attached to the decision than it deserves, and he calls attention to the fact that, if the charters of each member of the Sugar Trust become forfeited in successive suits, a stock company will be formed by all the interests involved, which will take the place of the trust and do all that it has done.

The New Haven Water Company propose to build a large dam at Woodbridge, to be 43 feet in height, and have a capacity for 300,000,000 gallons.

James G. Blaine, Jr., decides to become a mechanical engineer, serving an apprenticeship under master mechanic Pillsbury, at Waterville, Me.

The great problem, the employment of convicts in State prisons, was the subject of a bill presented in the New York State Legislature last week by Mr. Crosby on behalf of the Prison Association. It practically restores the State-account plan. The Yates bill is repealed, but a part of the system established by it is left. The bill provides that instead of all the prisoners being employed in the manufacture of articles used in State institutions, only so many shall be kept at that work as are needed to supply the institution. Experience has shown that this means a very small percentage of the 3300 or 3400 inmates of prisons. The rest of the convicts under the new bill are to work on the State-account plan, with this proviso: That the number employed in any one industry shall not exceed 10 per cent. of the free laborers employed on that industry in this State. It is thought that the bill will pass the Legislature despite the opposition of some of the manufacturers and labor organizations. The labor men will introduce a bill retaining the present Yates law so amended that the great bulk of convicts shall be employed on State farms and public works.

English investors are attempting to control the largest sugar factories in Cuba, but it is thought that they can "never get the best of the American market."

There are in Connecticut 85 savings banks, with deposits of \$105,850,078.95, an increase of deposits for the year of \$3,660,144.23.

During 1888 the total output of the shipbuilding yards of the United Kingdom is put in round figures at 900,000 tons, or 825,000 tons more than in 1887. The value of the property thus created, at a moderate estimate, must exceed \$45,500,000.

A consular report received in England is to the effect that the piracy of British trade-marks is practiced in Germany on the largest scale. It is charged that Germans sell words in Africa "by the millions" bearing the Queen's portrait on the blades.

The Brazilian flag is to be hoisted on four Atlantic packets, the Legislature having granted to Baron de Jacaguay a subsidy of 300,000 milreis a year for lines of packets between Hamburg and Santos and Genoa and Santos, making each six round trips a year.

The State of Minnesota, in deference to the wishes of labor organizations, a few years ago abolished contract labor in the State prisons. The problem now presented, according to the statements of the Governor in his biennial message, is: How

shall the prisoners get work? "When the State furnishes convicts by imprisonment, it should at the same time do its part to bring about their reformation. To this end, the industries of the prison should be, as far as practicable, such as will qualify them to follow useful pursuits after their terms have expired, and they again take their places as citizens of the State." In this view the most capable prison managers seem to have nearly agreed.

The contract for building an addition to the Ridgewood Reservoir, in Brooklyn, was awarded to Edward Freil, whose bid was \$293,770, or \$100,000 below the estimates of the engineer.

According to *Kuhlow's* there are several large orders in the English market for steel rails and sleepers. The South Indian Railway asks for 23,000 tons of rails, with fish plates, &c., and 24,000 tons of transverse steel sleepers, with 800 tons of bolts and other fittings. Large quantities of steel rails and sleepers are also wanted by the Southern Mahratta Railway Company. In addition to these orders, another for rails, larger than either of the above, is in course of being arranged for Victoria, "which it is hoped may come to Germany." The same journal also says that there is a heavy demand just now in most large machinery-making establishments for heavy machinery for large equipment works and machinery-manufacturing establishments, and that leading engineering works are oversold for from three to four months. A very large portion of the contract work placed since July 1 is special, and embodies specific improvements or inventions. The equipment of the new machine and railroad shops is strengthening the machinery market, and is causing more or less overtime to be made.

The cotton goods industry in the United States last year prospered more than any other important branch of textile manufactures, particularly in the domestic trade, as the export trade shows less improvement. Fall River dividends averaged 9.85 per cent., against 8.3 per cent. in 1887. Outside of Fall River many corporations show a decline.

The New Orleans import trade has gained 75 per cent. in six years, and merchants there now hope to regain the business lost since the war. The value of merchandise entered in 1888 was nearly \$18,000,000.

Advices from Washington Territory show the rapid strides making by that section of country in all the leading industries. The output of lumber from the saw mills on Puget Sound last year is valued at \$5,397,000, and of the entire Territory \$7,776,000, exclusive of "small stuff." Less than seven years ago the Baltic controlled the imports of lumber into Australia. Now Puget Sound has driven the Swedish product completely out. Large shipments are made from Puget Sound to Adelaide and Brisbane, and at last accounts two vessels were loading for London. Trade with South America is gaining every year, and that country is now the second largest purchaser. The total tonnage of vessels entering Puget Sound during the year was 941,167 tons. Seattle, the chief city and commercial depot of the Territory, promises to become the center of large manufacturing interests. It now has three iron works, one brass works and two boiler-making establishments. The Moss Bay Steel Company, which has located its works on the east shore of Lake Washington, is an enterprise far greater than any other iron enterprise on the Pacific Coast. It proposes to create smelting, rolling and subsidiary works on a large scale, and to employ a force of 5000 men. The supply of ore will be drawn from the Snoqualmie mines.

MANUFACTURING.

Iron and Steel.

A report was current in Pittsburgh last week to the effect that Mr. Andrew Carnegie had purchased the interest of Henry Phipps, Jr., in the firm of Carnegie, Phipps & Co., Limited, paying \$2,000,000 for the same. Upon being interviewed on the matter Mr. Carnegie stated that there was no truth in the rumor whatever. Since the retirement of Mr. Phipps as chairman of Carnegie, Phipps & Co., Limited, that gentleman has occupied the same relation to the firm as Mr. Carnegie—that of consulting partner without salary. We also learn that the report that H. M. Curry had succeeded to the office of chairman of Carnegie Bros. & Co., Limited, made vacant by the death of D. A. Stewart, is also without foundation. The latest report is that Mr. Frick, long identified with the Carnegie interests, is to be the successor of Mr. Stewart.

For the last 16 days in December the total output of the two Lucy Furnaces, of Carnegie Brothers & Co., Limited, at Pittsburgh, was 6479 tons, furnace No. 1 having made 2709 tons, and furnace No. 2 3770 tons. The highest output in one day was 267 tons, made by furnace No. 2, and the lowest was 145 tons, made by furnace No. 1.

During the year 1888 there have been 67 Smith gas producers and furnaces erected in this country and Canada, including 16 now in course of erection, as follows: Four for Minnesota Car Company, Duluth, Minn.; two for Union Steel and Iron Company, St. Joseph, Mo.; two for the American Wire Nail Company, Anderson, Ind.; two for the Tredegar Company, Richmond, Va.; two for the Chicago Horse Shoe Company, Chicago, Ill.; one for the Richmond Standard Spike Company, Manchester, Va.; one for the Virginia Nail and Iron Works Company, Lynchburg, Va.; one for the Judson Mfg. Company, Oakland, Cal., and one for Henry Warden, Philadelphia. The patents for the erection of the above furnaces are controlled by Alex. Laughlin & Co., engineers and contractors, Cleveland, Ohio, and M. V. Smith, of Pittsburgh.

On the 9th inst. a wind and rain storm blew over two of the stacks at the plant of the Sunbury Nail, Bar and Guide Iron Mfg. Company, at Sunbury, Pa., killing a number of the workmen, and seriously injuring others. The damage done was quite extensive.

The trustees for the creditors of Brown, Bonnell & Co., Youngstown, Ohio, have commenced proceedings on behalf of 44 creditors to obtain judgment aggregating \$18,000. The Menominee Mining Company have also brought suit for \$2869 due on a consignment of iron ore.

The new Soho Furnace of the Moorhead-McCleane Company, of Pittsburgh, was blown in on November 15 last, and from that date up to December 31 of last year it produced 8850 gross tons of pig iron. This is a much larger output than was anticipated for it by the owners.

The furnace owned by the Niagara River Iron Company will again be put in operation. The furnace has been idle nearly 12 years. It was built in 1873-4 by the present owners, among them Messrs. S. S. Jewett, Josiah Jewett, P. P. Pratt, F. H. Root, George B. Hayes, and the Glenny and Austin estates. The property is located at Ironton, near Buffalo, between Black Rock and Tonawanda, and has been leased by Frank A. Baird and others of Perry County, Ohio. Mr. Baird is one of the owners of the Baird Furnace. The furnace originally cost about \$400,000. The plant will be put in order and it is

expected that the furnace will be blown in about April 1st. At present there is not a furnace in operation at Buffalo. When the Niagara Furnace was built the furnaces of the Union Iron Works and the Fletcher Furnace were in operation. The Fletcher was the last to suspend. — *Bulletin*.

It is probable that the plant of the Warren Tube Company, at Warren, Ohio, will be disposed of at an early date. Week before last Messrs. John O. Hart, J. B. Graham and S. A. Corbin appraised the plant at \$89,000, which allows of its being sold for \$60,000. The first appraisement was \$115,000, and the works could not be sold for the two-thirds of that amount.

Mr. S. P. Williams, of Philadelphia, has received the appointment of general manager of the works of the Standard Iron Company, at Bridgeport, Ohio, to take the place of Mr. T. B. May, who resigned some time since. The appointment takes effect on the 15th inst.

The wages at the Edgar Thomson Steel Works of Carnegie Brothers & Co., Limited, at Braddock, Pa., for the present month will be based on rails at \$30 per ton. It will be remembered that in the early part of last year an arrangement was made with the men at these works, by which the wages to be paid each month were to be based on the selling price of rails for that month. At the time this plan was submitted to the men there was considerable opposition to it, the men stating that they would be unable to make the wages they formerly made. However, the reverse has proven to be the case. This sliding scale has been in force now for some months, and under it the workmen have made better wages than before it was adopted. Last month the rate of wages paid was based on rails at \$28.50 per ton. At the present time it is a well-known fact that rails are selling considerably under \$30 per ton, and the firm's object in basing wages on rails at that figure is a mystery.

The Gray's Ferry Iron Works, in Philadelphia, shut down in March, 1888. The works have since been dismantled, sold and converted to other uses than iron working. They were built in 1858 by Mr. Edward S. Buckley, who owned them until the time of their sale last year. The product of the works was plate iron and charcoal blooms.

Carnegie, Phipps & Co., Limited, of Pittsburgh, have been awarded the contract for the rails of the extension of the Wheeling and Lake Erie road from Bow-erstown to Martin's Ferry, Ohio. Four thousand tons will be required.

Lemont Furnace, in Fayette County, Pa., has been abandoned and the machinery removed to Alabama. The Messrs. Hogsett, who owned Lemont Furnace, have built a large coke furnace at Trussville, Ala.

During the year 1888 the blast furnace of the Bellaire Nail Works, at Bellaire, Ohio, produced 51,750 gross tons of Bessemer pig iron, while the steel department turned out 64,827 gross tons of billets and slabs. At the annual meeting of the board of directors of the company, held on the 24th ult., a semi-annual dividend of 5 per cent. was declared.

The two Fox River charcoal furnaces, at West Depere, Brown County, Wis., are to be dismantled in the spring.

Laurel Furnace, at Locust Point, Baltimore, owned by Messrs. R. C. Hoffman & Co., of Baltimore, is for sale. It is a charcoal stack, 9 x 50 feet, and was rebuilt in 1882.

The Warwick Iron Company, of Pottstown, have elected the following officers, all excepting president and treasurer being from Philadelphia: President, Isaac Fege-

ley; managers, Peter Schemm, Vincent P. McCully, Jacob Rech, Philip Doerr, Charles G. Burlinger, Louis Bergdoll; secretary, Vincent P. McCully; treasurer, Jacob Fegeley. Edgar S. Cook is superintendent.

Sharon Furnace, of the Sharon Iron Company, at Sharon, Pa., has resumed operations after an idleness of several weeks caused by the caving in of the lining.

The Wheeling Steel Works, at Wheeling, W. Va., have signed the Amalgamated Association scale of wages for the ensuing year.

The Green Forest Furnace, Mfg. and Land Improvement Company have been organized at Lexington, Va., with a capital stock of \$500,000. A. T. Barclay has been elected president. The object of the company is to develop the rich Buena Vista iron mines at Green Forest, on the Richmond and Allegheny and Shenandoah Valley Railroads, lay out a town and build a 200-ton iron furnace.

Ivanhoe Furnace, in Virginia, recently remodeled to work on coke, has been running for two weeks.

Machinery.

On Saturday, the 5th inst., the *Ætna* Machine Company, of Warren, Ohio, closed a contract with the Chicago Splice Bar Mills, owned by Morris Sellers & Co., of Chicago, to furnish them with a 500 horse-power engine to drive a train of rolls in their mills in that city.

The annual election of the Lloyd-Booth Company, of Youngstown, Ohio, proprietors of the Falcon Foundry and Machine Works, held last week, resulted as follows: President, Lloyd Booth; vice-president, H. M. Garlick; treasurer, C. H. Booth; secretary, C. W. Bray. The company report that they have plenty of orders on hand, and that the outlook for the year just entered is very encouraging.

The American Wire Company, of Cleveland, Ohio, are placing in their works what is claimed to be the heaviest leather belt in use in that city. It is 60 inches wide, 140 feet long and weighs 1593 pounds, being double thickness. It will drive about 1000 horse-power at times, and will run from band wheel of a Corliss engine 24 feet in diameter, with 62-inch face and $\frac{1}{4}$ -inch crown, running at a speed of 80 revolutions per minute, giving a belt velocity of over 6000 feet, or over 1 mile per minute. This belting was made for this concern by the Jewell Belting Company, of Hartford.

The Baldwin Locomotive Works, at Philadelphia, turned out 787 locomotives last year, or at the rate of over two per day.

The Westinghouse Electric Company, of Pittsburgh, have received the contract for lighting the city of Toronto, Canada, with 3000 lights. The plant will be operated by the Toronto Gas Consumers' Company.

Ewald Iron Company, St. Louis, Mo., are mailing to their friends in the trade something very neat in the way of a memorandum book. It is $2\frac{1}{4}$ inches wide by 4 inches in length and just fits the vest pocket, for which it is evidently intended. The blank sheets are removable and pads for future use can be obtained by applying to the above firm. It contains some useful and interesting information, giving approximate weight per foot of round-rolled and square-rolled iron, also table for computing weight of boiler-heads and weight per foot of angle irons. In addition it contains calendar of current year.

Albert B. Bowman, 823 North Second street, St. Louis, Mo., reports a large increase in his sales during the past three

months in comparison with the corresponding months of 1887. He reports a number of sales of Erie engines, Giddings medium high-speed automatic engine, for electric lighting stations, and Cleveland and Hardwick slide-valve engines.

The new catalogue of the Lidgerwood Mfg. Company may be said to be indicative of the machines produced by them, being of unusual interest. The paper and press-work are unexceptionable and the illustrations are good samples of engraving. Among the new cuts we notice improved quarry engines, hoisting engines, stationary engines, &c. The improved hoisting and conveying apparatus, designed especially for quarries, bridge and dam building and contractors' uses, is fully illustrated and clearly described, as is also the special engine to be used with this apparatus. The inclined cable for quarries is likewise shown.

Hardware.

We are advised that the goods of the Waltham Emery Wheel Company, Waltham, Mass., received the highest award of merit at the Cincinnati Exposition. They report business as good.

E. S. & F. Bateman, Spring Mills, N. J., refer to the increase of their business from year to year, and the growth of their plant and facilities. They allude especially to their magnificent water supply, of which they say it has never once failed them—father and sons—of furnishing an ample supply during their occupancy of over half a century.

Wilson Bohannon, Brooklyn, N. Y., in order to meet the demand of his increasing trade and the enlargement of his line of locks, has built a new factory, giving him improved manufacturing facilities.

The Hollow Cable Mfg. Company, Hornellsville, N. Y., are now located in their new factory bordering on the tracks of the New York, Lake Erie and Western Railroad, where they have exceptionally good shipping facilities. The factory is 40 x 140 feet, and thoroughly equipped with new power and improved heating apparatus throughout, thus putting them in excellent shape for the manufacture of their braided barbless fence wire, hollow cable wire clothes lines and box bands.

The Ludlow-Saylor Wire Company advise us they are actively engaged in all their departments, and the demand for their new artistic iron sign—which they recently placed on the market, and which was illustrated in these columns a few weeks since—is very gratifying. They also report an increase in their 1888 business over that of 1887 of 25 per cent.

The St. Louis Wire Mill Company have just completed the new wire mill erected on the site of the one burned last September. It is divided into two compartments, one of which is utilized for bathing and baking the wire preparatory to its being taken into the drawing-room, which occupies the other compartment, where the wire is drawn to the various sizes required. The drawing-room contains 66 wire blocks, all of which are in active operation. The power required is obtained from a 350 horse-power throttling cut-off Corliss engine, made by the St. Louis Iron and Machine Company, St. Louis, Mo.

The Gilbert & Bennett Mfg. Company, Chicago, Ill., and Georgetown, Conn., were recently awarded the contract for about four miles of their World's web wire fencing and several gates to inclose the new military post, at Highwood, Ill. This fence is referred to as having longer twists, and is galvanized after the wires are woven, making, it is claimed, an especially strong and durable inclosure. The fence has been furnished, put up and approved. The

company have also just completed an extensive addition to their wire mill at Georgetown, Conn., and are now able to make the wire and all the goods they manufacture.

Simonton & Co., Kidd Steel Wire Company, Pittsburgh, Pa., advise us that they have just completed putting natural gas in their works at Harmarville, and that they now have a capacity of 1000 pounds polished drill rods daily. They also refer to reports from consumers as being already received bearing testimony to the quality of their stock as equal to Stubs' imported rods.

The Freeman Wire Company are feeling very much encouraged with the favorable inauguration of their new wire and iron works department at No. 410 North Main street, and are increasing their force of workmen and putting in additional machinery and appliances to meet the requirements of their rapidly developing and increasing trade. They are now considering the advisability of increasing their facilities by adding a 25 horse-power engine to their plant to provide the power necessary to drive the machinery and supply a dynamo to run electric lights. They have shipped several good orders South on work secured by their salesmen, and have also completed a job in bank partition railing for the Chester Commercial Bank, at Chester, Ill. They report the outlook for contract work very good, having secured the order of Mr. Edward Henry for fitting up his Crescent Stables on West Olive street with the wire and ironwork for about 100 stalls, and have the following contracts in hand for elevator inclosure work: Cunningham Bros., Eighth and Lucas avenues; H. L. Fox, new building, Ninth and St. Charles streets, to be occupied by Brown-Daughaday Wholesale Dry Goods Company, and have in co-operation with the Union Brass Architectural Works, of Chicago, Ill. (who furnish the brass-work for the first floor), the wire and ironwork for the remaining seven floors to inclose two pair double service elevators for Odd Fellows' Hall, corner Ninth and Olive streets.

In a review of the business of the last three years, the anomaly is presented of a number of failures above the average, despite the indications of general prosperity. An explanation is not readily found, but the situation is stated by the *Financial Chronicle* as follows: "One statement no one will deny, and that is that the risks of business must have increased; that industrial pursuits must have become uninterruptedly more hazardous. That is always the case when values have reached an inflated level. Or it might be the case when there was any condition which left the margin of profit fluctuating, doubtful, or very narrow. Certainly, as to the meagreness of profits there has been great complaint. We can see that fact illustrated and a struggle against it in the trusts that have been formed of late years. A narrow margin for profits tries the trader severely. For it is only the merchants of intelligence, judgment and close business methods who can succeed with such surroundings. Large capital, too, permits economies which small or borrowed capital prevents, and large business covers expenses which small business fails to meet. So accurately does this describe the situation now that it has almost run into a proverb that only the mill which is well situated, which is capable of large production, which is well managed and has modern machinery and abundance of capital, can prosper. Where is the place for the small trader with his borrowed capital in such a fight? Would he not naturally become discouraged, venture-some, and fail?"

The Iron Age

New York, Thursday, January 17, 1889.

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF, JR., - EDITOR.
GEO. W. COPE, - - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS, - - HARDWARE EDITOR.
JOHN S. KING, - - - BUSINESS MANAGER.

The Railroad Situation and the Iron Trade.

It is admitted by all the leading authorities in the iron trade that its near future will be shaped very largely by developments affecting the position of the railroad interest. Briefly summarized, the principal features developed during the past year were these: In spite of a decline in the requirements of steel for new mileage, our consumption of domestic iron has been equal to that of the year 1887 when 15,000 miles of railroad were built. Roughly, the falling off in the demand was compensated for by cutting off a large share of our imports. Prices abroad have hardened steadily, while ours have declined in many lines, and have at best held their own in others; therefore the tendency has been for some months past to cut down sales of foreign material even further. To that extent home producers will be relieved, and they need only reckon with the two factors of domestic production and consumption. The former is progressing at an unprecedented rate, so far as the basis of the whole business—the manufacture of pig iron—is concerned. The question is whether the demand can cope with it. The softening of prices lately would indicate that it cannot, but that is possibly a merely temporary matter caused by the halt in consumption which is usual at this season of the year.

Dealing with the subject broadly, we may divide the consumptive requirements into two great groups. One embraces the quantities absorbed for agricultural purposes, like fence wire; for building, like nails, beams, channels; for domestic uses, like stoves; for town service, like water and gas-pipe, street railroads, &c., and for the general industries of the country, like engines, boilers, machinery, &c. The second takes in the railroad requirements, including primarily rails and track material, iron and steel in many forms for rolling stock, and for subsidiary foundry and machine shops working chiefly for the railroads. We are convinced that the general average prosperity of the country gives every assurance that the volume of business in the first group will be satisfactory, however inadequate the margins of manufacturers may be.

The uncertain element is the demand of the second group. That is the part of the trade which so keenly and so quickly feels the influences which speculation in Wall street, to a large extent, reflects in an exaggerated form. The business world accepts as an axiom that the iron trade is the barometer of the prosperity of the country. It would be if we could separate from it the consumption of industries dependent upon the railroads as their customers. They look to the movements in the great financial world to furnish them with a cue.

To those who are connected with them there is something ludicrous in arguments of bulls or bears, based on the condition of the iron trade as a barometer which predicts coming sunshine or cyclone. They are converting into manufactured goods money raised months ago in the financial centers. Their activity is proof that funds have been invested. It does not furnish a fair indication that further outlays would be profitable.

Viewed from this standpoint the developments in the railroad world during the past week possess extraordinary significance for all engaged in the iron and steel trades. Let it be granted at once that reasonable doubts have not been removed, and that important points are still to be settled. But there has been an earnest effort on the part of the principal officers of a number of warring railroads to reach an understanding whereby the power for doing irrevocable mischief is taken out of the hands of petty subordinates. Hasty action often dictated by unworthy personal motives will be superseded for some time to come by the caution and deliberation growing out of individual responsibility. A truce has followed the disastrous warfare which plunged great interests into confusion and has brought them to the verge of disaster. The gain, such as it is, promises to be important. It is the first step toward recovering confidence. While there is always the possibility that all may be undone in the near future, the chances favor progress in the same direction.

It will be conceded that considerable time must elapse before some parts of the country will have grown up until they can support the new mileage provided during the past two years. This is notably true of Kansas and the Northwest. To a considerable extent extension of railroad mileage has been reckless, but it does not follow that errors made there should check legitimate development in other sections of the country. It would be useless to deny that they have embarrassed it. But though one set of investors have been hurt or are financially weak, others are seeking opportunities to profitably place surplus earnings. The moral effect upon them of the disasters which have overtaken some of the roads which built extensions in Kansas and in the Northwest would soon be lost sight of, especially if they obtained the conviction that the capitalization of new ventures was nearer cost than it has been hitherto. A revulsion of feeling in financial circles, which might readily follow a few months of peace, would cause the maturing of many plans for extensions in other parts of the country, and notably in the South, which are now languishing.

Thus far the predictions of new mileage in 1889 are necessarily little better than guesses, with the balance of probabilities in favor of those who name low figures. But it must be considered that railroad construction itself is carried through nowadays at an enormously accelerated rate. Work occupying years formerly is now crowded into one season, so that the consumption of material for new undertakings follows far more quickly the completion of financial plans. This in itself tends to render more readily possible sudden recovery from apathy in buying.

The only hope for a better condition of the iron and steel trades lies in the growth

of a feeling of confidence in financial circles over the railroad situation. Should that not be realized, should there be a notable falling off in the new mileage in 1889, as compared with 1888, when it was about 7000 miles, a gap would be created in the demand which would force a restriction of output. The next month or two must decide. The start has been made against serious obstacles.

The Impending Revival in Peru.

The proclamation by the United States Government on November 7th last of the conclusion of a comprehensive treaty of amity and commerce with Peru encourages expectations that under its operation mutual prosperity and good understanding will be promoted. It coincides with the remodeling of the Grace-Tyler-Aranibar contract through negotiations between the Peruvian Minister of the Treasury and Lord Donoughmore, the bondholders' representative, who in August last proceeded from London to Lima. In accordance with authority given the latter embodied in the new contract, the bondholders agree, fully, absolutely and irrevocably, to free Peru from all responsibility for the loans made abroad in 1869, 1870 and 1872, representing the sum of £54,000,000. The bonds are to be canceled and so exhibited before the contract goes into effect. A company is to be organized in London to which will be transferred all the concessions, grants and property ceded by this contract for the purpose of mortgaging them, in order to raise money for the work proposed. All questions arising are to be decided by the courts of Peru, and the company shall be considered to have their domicile at Lima. They, the bondholders, will pay over £50,000 on ratifying the contract, and 19 monthly payments of £10,000 each, and Peru guarantees to them the sum of £80,000 for 80 years as a security for interest on the £6,000,000 proposed to be immediately expended in the undertaking. But these reciprocal payments do not commence until the beginning of the fourth year of the contract.

All the guano in Peru not subject to the conditions of the treaty of peace with Chili is to be given to the bondholders, excepting such amounts as the country requires for its agricultural necessities, and the Chincha Island deposits are to be worked for that purpose if they should be sufficient. Peru, furthermore, gives the bondholders her national railways, certain grants of agricultural lands and certain mines. The bondholders agree to complete the roads and maintain them in perpetuity. The mining rights extend over a long series of years. The mines are silver, coal, quicksilver, &c., and are said to hide untold riches. The railways are expected to yield £80,000 a year. The grant of land for colonization is 1,800,000 hectares, of 2½ acres American, or about 70,000 square miles. The syndicate property is to be free from taxation, and whatever may be imported is to be duty free.

The trouble that threatened to arise about the Arequipa, Puno and Cuzco railroad, the property of the American contractor, Mr. Thorndike, and about the Lima-Oroya Railroad, on which Mr. Grace, of New York, had made a contract, will, of course, be done away with

by the final ratification of the Donoughmore settlement by the Plenary Congress of Peru, to assemble during the present month at Lima. The Donoughmore settlement had been submitted to the Chamber of Deputies of Peru on November 25, and returned unratified by the same four days later, by a vote of 50 to 38, simultaneous, by an additional protocol, considered objectionable, by a vote of 71 to 15. The Senate being ready to ratify the settlement, it will be again submitted to the Plenary Congress in extraordinary session, and there is little apprehension that it will not pass. Should, contrary to expectations, ratification be denied, the bondholders appear resolved to dispose of their claims to Chili, in which event the latter would be the sole creditor of Peru, with a positive right to her customs revenues, her railways, &c.—in a word, all her means of maintenance, and in the present and weakened condition of Peru she could offer no resistance.

Once the settlement is ratified, the American railroad contractors, being again placed in possession of their property, would perhaps induce their colleagues at home to assist in perfecting the Peruvian system, which, toward the Amazon Valley, has, in conjunction with Brazil, a great future, and American exports to Peru would perhaps receive a renewed impulse. The \$60,000,000 paper money in circulation in Peru became next to worthless last spring, the people refusing to take it any more, and there is, besides, a bonded home debt of \$55,000,000, both of which might become a subject for a domestic compromise on equitable terms from the moment the Donoughmore settlement was ratified, and thereby Peru's foreign credit restored in an honorable manner to the satisfaction of the bondholders who, through their influence in the London and Continental money markets—would naturally do all in their power to befriend a country in whose regeneration they would henceforward have a direct interest.

The revival of Peru and her mining industry, as well as her sugar planting interests, and the many other resources the country possesses, will prove a great gain in trade on the West Coast. Before the war with Chili Peru produced 60,000 tons of sugar, in 1888 she produced only 30,000 tons, because the fine machinery of half of the sugar estates was destroyed during that unfortunate strife, and there was no money for replacing it by new machinery since. Everywhere the war left its mark; indeed, there are few countries that have been so thoroughly ruined. But the great resources which the incendiary's torch could not reach are there still, and only await capital, enterprise and labor to cause them to yield liberally.

American trade with Peru, through the impoverishment of the people there, has shrunk to insignificant proportions.

Fiscal year.	Import.	Domestic export to Peru.
1888.....	\$300,400	\$865,180
1887.....	461,726	717,968

Before the war, when Peru had its guano to draw upon, and London to float its loans in, the people spent money freely, and so they no doubt will after a return to prosperity; all trading nations will, therefore, be glad to see them in a flourishing condition once more.

The Sources of Our Iron Imports.

The Bureau of Statistics publishes annually elaborate tables showing in detail the countries from which the goods we import come. These figures, unfortunately, deal with the fiscal years; still they are of considerable interest, since they give a good general idea whose customers we are. During the fiscal year ending June 30, 1888, we imported 919,644 gross tons of iron ore, as compared with 1,141,744 tons in the fiscal year 1887. The following table shows the principal countries from which we import:

Imports of Iron Ore, Fiscal Years, Gross Tons.

	1887.	1888.
Total.....	1,141,774	919,644
Spain.....	522,719	416,138
Algeria.....	215,760	163,496
Cuba.....	109,928	117,504
Italy.....	114,423	98,343
England.....	72,546	56,090
Greece.....	44,173	25,707
Canada.....	23,431	13,330

The only gain has taken place in the case of Cuba, where the Juragua Company are operating. Even here the quantities are small considering the magnitude of the operations of the two steel companies who are interested in the mines.

For pig iron, which, of course, includes spiegeleisen and ferromanganese, the figures stand as follows:

Imports of Pig Iron, Fiscal Years, Gross Tons.

	1887.	1888.
Total.....	413,919	325,517
England.....	279,150	161,788
Scotland.....	81,506	105,982
Germany.....	47,169	46,713
Netherlands.....	2,552	345
Spain.....	2,300	2,002
Belgium.....	1,696	1,948
Sweden.....	556	4,106

The falling off, it will be observed, has been chiefly in the shipments from England, counterbalanced to some extent by the increase from Scotland. We have bracketed Germany and the Netherlands because, probably, the shipments of the latter country are produce of the former.

Scrap comes to us naturally from many sources, the following table giving the figures for the two fiscal years 1887 and 1888. They, of course, include old iron rails, but do not include steel scrap, such as bloom ends, crop ends, &c.

Imports of Scrap Iron and Old Rails, Gross Tons.

	1887.	1888.
Total.....	245,755	142,067
England.....	103,322	56,117
Scotland.....	18,259	6,120
Ireland.....	4,327	3,199
Netherlands.....	20,787	10,589
Germany.....	33,260	19,916
France.....	14,792	8,172
East Indies.....	10,437	7,287
Belgium.....	9,804	1,948
Sweden and Norway.....	7,558	7,616
Cuba.....	4,019	2,565
Spain.....	3,964	.....
Denmark.....	2,478	4,067
Argentine Republic.....	2,067	2,304
Canada.....	3,147	2,153

In steel scrap the principal means of supply are naturally the leading manufacturing countries, as the following table shows:

Imports of Steel Scrap, Fiscal Years, Gross Tons.

	1887.	1888.
Total.....	28,012	13,019
England.....	9,307	7,647
Scotland.....	3,385	1,597
Ireland.....	1,103	.....
Germany.....	1,708	1,215
Belgium.....	1,169	167

France.....	1,586	.....
Canada.....	5,052	1,743
Spain.....	2,300	.....

In rolled or hammered bar iron Sweden and Norway lead, England, Germany and Belgium following with small quantities:

Imports of Bar Iron, Net Tons.

	1887.	1888.
Total.....	37,036	37,182
Sweden and Norway.....	28,819	22,171
England and Scotland.....	4,305	5,624
Germany.....	1,870	4,481
Belgium.....	3,487	4,329

It will be observed that practically the quantities of bars imported here remained the same, but that there has been a falling off in the quantity of Swedish bars, while there has been an increase from other sources. This is probably due chiefly to the inroads of mild steel upon the territory occupied by the Swedish material.

In steel rails there was an increase from 77,026 tons in 1887 to 136,799 gross tons in the fiscal year 1888, England shipping 60,718 tons and Germany 11,031 tons of the former quality, while in the last year English manufacturers sent 118,519 tons and German makers 12,136 tons, with Belgium credited with 2040 tons.

Cotton ties came exclusively from Great Britain, the quantities having been 14,119 net tons and 21,348 net tons, respectively, in the fiscal years 1887 and 1888.

In steel hoops, bands, sheets and plates the figures stand as follows:

Imports of Steel Hoops, Sheets and Plates, Net Tons.

	1887.	1888.
Total.....	17,564	25,112
England.....	11,338	14,399
Scotland.....	3,867	7,742
Germany.....	2,010	1,416
Belgium.....	346	1,488

In steel ingots, blooms, billets and slabs England has the greater part of the trade. In the fiscal year 1887, out of the total imports of 319,689 net tons, England was credited with 198,784 net tons, Scotland with 19,873, Ireland with 1524, Germany with 77,015 tons, Belgium with 16,406 tons, and Sweden and Norway with 4622 tons. In the fiscal year 1888 the total quantity was reduced to 207,245 net tons, in which the leading countries participated as follows: England, 113,633 net tons; Scotland, 16,347 tons; Germany, 53,418 tons; Belgium, 19,234 tons, and Sweden and Norway 4,340 tons.

The bulk of the steel plate and taggers iron imported comes from Great Britain, the total quantities imported in the two years having been 7537 net tons in the fiscal year 1887 and 8175 tons in 1888. The only item of interest is that the imports of sheet iron from Russia, the genuine sheets, fell off from 2033 net tons in 1887 to 1075 tons in 1888. It is fair to assume that this is due to the growing recognition of the quality of the home product.

Tin plates come exclusively from England, although small quantities—3069 tons in 1887 and 1149 tons in 1888—are credited to Canada, through which country they, of course, merely passed in transit. The total imports were 286,110 net tons in 1887, and 317,472 net tons in the fiscal year 1888. There is probably no single item in the wide range of the metal and iron trades which reflects more closely the steady growth of the consumption of the country at large than the quantities of tin plate imported. The article enters into a number of important lines, for whose ac-

tivity it furnishes a good indicator. The imports of tin plate are interesting in another particular, as it is in this item that direct imports in bond to interior cities have developed most. The following table gives the details:

Imports of Tin Plates by Customs Districts, Net Tons, Fiscal Years.

	1887.	1888.
Total.....	286,110	317,472
Baltimore.....	39,907	44,259
Boston and Charleston.....	12,798	12,412
Buffalo Creek, N. Y.....	892	1,043
Chicago.....	14,216	27,137
Cincinnati.....	682	1,504
Galveston.....	221	1,203
Huron.....	2,972	775
Indianapolis.....	292	949
Kansas City.....	3,274	3,577
Louisville.....	294	584
Miami, Ohio.....	303	626
Milwaukee.....	1,763	2,345
New Orleans.....	2,908	5,288
New York.....	119,437	125,784
Oregon, Ore.....	3,763	1,787
Philadelphia.....	45,396	58,714
Pittsburgh.....	1,225	2,147
Portland and Falmouth, Me.....	4,409	1,642
St. Joseph, Mo.....	437	742
St. Louis.....	4,591	5,755
San Francisco.....	13,298	15,530
Willamette, Ore.....	1,040	930
Yorktown, Va.....	857	1,032

It will be noted, in a general way, that the interior towns have gained considerably, the most notable increase being that of Chicago, which has nearly doubled its direct trade in one year.

Germany retains its supremacy in the rod trade, the figures standing as follows:

Imports of Wire Rods, Net Tons, Fiscal Years.

	1887.	1888.
Total.....	161,269	135,470
Germany.....	97,376	78,763
Netherlands.....	15,010	1,075
Belgium.....	13,475	15,499
England.....	9,927	11,368
Sweden and Norway.....	25,482	29,345

The export of wire rods from the Netherlands is somewhat surprising, since no rods are manufactured in that country, and as the duty is levied at the rate of 45 per cent. ad valorem at the works producing the article, there must have been some special causes to lead to the statement by the importer that the Netherlands were the source of supply. The table given above is of interest in this respect, that it indicates how large a proportion of the total imports are common basic and acid rods, for fence wire and ordinary market wire. Practically, all of the imports from Germany, the Netherlands and Belgium come under this head.

The Bureau of Statistics prints also in detail the imports of merchandise by customs districts. We have believed it a matter of general interest to show how large a proportion of the total imports of iron and steel went to Pacific Coast ports, because it is in that part of our country where foreign producers have the greatest advantages in their favor.

Imports into the Pacific Coast.

	1887.	1888.
Articles.	Total	Pacific Coast. Total.
Iron ore, gro. tons.	1,141,774	5,172 919,644
Pig iron, gro. tons.	418,919	19,297 325,517
Scrap " gro. tons.	245,755	20,019 142,087
Bar iron, net tons.	37,036	962 37,182
Steel rails, gr. tons.	77,028	401 136,799
Steel ingots, billets and slabs, n't tons.	319,684	12,646 207,245
Tin plates, net tons.	286,110	18,100 317,472
Wire rods, net tons.	161,269	1,204 135,470

There has therefore been an increase in nearly every item, the most notable one being that of rails. The Pacific Coast has taken over one-half of the whole imports in the fiscal year, 6913 tons going to Puget

Sound, 11,484 tons to San Diego, 45,841 tons to San Francisco, 9652 tons to Willamette and 1500 tons to Wilmington, Cal.

An unwonted sensation was caused last week by the abrupt removal from office of Appraiser McMullen, and the temporary substitution in the New York Custom House of Appraiser Stevens, of Boston. Immediately reports were rife that enormous fraudulent valuations would be exposed as the result of a promised investigation, although no facts were cited in evidence of malfeasance on the part of the officer so summarily relieved. The Boston Appraiser was quoted, however, as charging that "the Government has been robbed of millions of dollars," and it was notorious that previous rumors reflecting upon the management of the Appraiser's Department in New York were supposed to have originated from the same source. Bearing these facts in mind, it seemed but fitting that Appraiser Stearns should be called upon to substantiate charges so serious. Simultaneously other experts were summoned to co-operate in making thorough inquiry, and Secretary Fairchild himself appears upon the scene, to obtain personally from leading importers conclusive evidence respecting the points in question. The cry of fraud is by no means original with this day or generation, for rival interests are quick to discover any opportunity which may be turned to advantage. Metals have already passed through a trying ordeal, and now other prominent staples in trade—notably sugar, tobacco and wool—are to be subjected to searching inquiry. In the present instance the suspicions of rival cities are excited, it being openly charged that discriminations in favor of New York are permitted, to the detriment of other Atlantic ports. Honorable merchants will deprecate the course of events. The cry of systematic undervaluation at this port has gained such currency, and the suspicions become so firmly established, particularly in the New England States, that it is well to probe the matter thoroughly, and either confirm or refute, by positive evidence, the damaging allegations.

The managers of the Paris Exposition have planned a series of "conferences" and "congresses" to be held during the current year. The aim seems to be to promote gatherings of men eminent in different branches of science, industry and professions to discuss questions of general or international interest. Ever since the Centennial Exhibition, when the first tentative and partly unsuccessful efforts were made in this direction, international conferences of specialists have been held, with results which have given much encouragement. There is every indication that, under the auspices of the management of the Paris Exposition, the system will be carried out under peculiarly favorable auspices. Even now a discussion of the mooted question of the nomenclature and classification of iron and steel is suggested, and there is some agitation for an International Congress on standard tests for iron and steel. M. E. Cornut, chief engineer of the association of owners of steam boilers in the North of France, has addressed a letter to the French Minister of Commerce and Industry, suggesting an inter-

national conference. He reviews the efforts repeatedly made in this direction and dwells on the importance of uniform standards of size. The subject had been so repeatedly discussed in this country, and its importance is so clearly understood, that it is unnecessary to go over the ground now. Since a large number of our leading metallurgical, mechanical and civil engineers are going abroad this year, and since a good many English and French engineers and iron and steel makers will be present at the forthcoming Paris meeting of the British Iron and Steel Institute, it would seem appropriate that the conference be held during the course of that gathering. A good deal of preliminary work could be done in this country by bringing the subject up before the meetings of the different societies which are to take place in the near future.

The present unfavorable outlook in the iron trade has not discouraged Benner, the famous prophet, who has just emphasized in a fresh bulletin the predictions made at an earlier time. His latest words are: "I predict that the price of iron will advance, and the average price for the year 1889 will be higher than the average of 1888, and I also predict that there will be a wonderful advance in prices for iron, stocks and all products and commodities in the year 1890. All business will be prosperous; it will be a year of good crops—the boom year in the period of activity. In the beginning of the year 1891 business will be at its height—a great business inflation—pig iron \$50 per ton in the markets of our country. I predict that there will be a panic in the year 1891. The over trading and general inflation of business and expansion of credit and confidence will produce the result." So far as the current year is concerned, these are words of good cheer, contrasting strongly with the hesitation and the feeling of weakness developed in nearly all sections of the country. We sincerely trust that the future may bear out Mr. Benner.

A successful experiment was made at the Standard Iron Company's works in Norristown, Pa., by the Continental Steel Car Wheel Company, with a process of making rolled steel car-wheels patented by Colonel Theodore W. Bean. It is claimed for these car-wheels that they are free from inequalities of the surface, thus avoiding vibration of the car; that they will have a mileage of 200,000 miles, while the life of a cast-iron wheel is 35,000 miles; that while the *papier mache* wheel costs \$50, and the cast-iron wheel \$12, they will cost \$12 or less; and that by actual test they will stand three times the strain an iron wheel will stand. The company operating this patent has a capital of \$100,000 subscribed, and will build a complete plant on the site of the Slemmer Oil Works in Norristown.

Of the sugar consumed in the United States last year it is estimated that 1,362,000 tons had passed through the refineries of the United States and 106,500 tons were consumed without refining. The Sugar Refineries Company handled about 1,000,000 tons and the independent refineries 359,000 tons.

The Central Railroad of New Jersey is having built a fine iron twin-screw steamer 260 feet in length, which will be launched in February.

CORRESPONDENCE.

The Coal Consumption of Heating Furnaces.

To the Editor: In your issue of 8d inst. I notice a statement that a ton of finished iron was heated by a Smith furnace, erected at Zanesville, Ohio, with only 255 pounds of slack coal. It is evident from the table given that the furnace ran single turns only. It would seem to be in order to ask your correspondent whether the coal given in the table included that used to keep the furnace up during the night, and get it hot for the next shift. Unless such coal is included the figures are apt to be misleading. In this part of the country we are accustomed to figure the tons of iron heated at 2240 pounds per ton, and not 2000 pounds, as is done in the case above referred to. In this connection it would be interesting, if correspondence was invited on the subject from many who have used gas heating furnaces, to really see what amount of coal is used per ton in actual practice, giving conditions, consecutive or intermittent work, kind of fuel, size of piles and weight, product per ton, &c. Yours respectfully,
S. PETERS.
PORTLAND, ME., January 9, 1889.

To the Editor: Replying to Mr. Peters' communication, to which you kindly call our attention, we beg to state that the record given of the fuel consumption of the Smith furnace we built at Zanesville did not include coal used to keep the furnace up over night, but simply showed coal used during "actual working hours." Our idea in publishing this record was to give iron manufacturers generally an opportunity to see the comparative fuel consumption of the Smith gas heating furnace as constructed by us and an old style coal burning furnace. We use the word "comparatively" advisedly, as experience has taught us that when a manufacturer says he uses from 900 pounds to 1200 pounds of nut or lump coal to heat a ton of iron in a coal furnace, he refers to coal used during "actual working hours" only.

Admitting the above statement to be correct, the question resolves itself into this: Will as much coal be required to keep up a Smith furnace over night as to keep up a coal furnace of the same capacity? In answering this we say No, without hesitation, as it is an obvious fact that the comparative saving at night must be the same as in daytime. We, in the West, also figure the tons of iron heated at 2240 pounds, but in referring to finished iron, which the record alluded to is based on, we consider a ton to be 2000 pounds. Now that this subject is opened up, we would like, in justice to ourselves, to state that we do not consider the Zanesville record one to be proud of, as the furnace never heated what we consider a full turn's work, the average for ten days being only 36,500 pounds of finished iron, while we know from actual practice elsewhere that it was capable of heating at least 45,000 pounds of finished iron in the same time. That it did not do so was in nowise the fault of the furnace, but was entirely owing to the disadvantages in equipment mentioned in *The Iron Age* of January 8.

For your correspondent's further information we might state that a 9-inch mill in this city, which has been operating one of our furnaces for some time single turn, advises us that their entire fuel consumption, including nights and Sundays, is only 400 pounds slack coal to the ton of finished iron, but they have been getting unusually large tonnage.

We agree with Mr. Peters that correspondence giving the actual gas furnace practice would be very interesting, but to

our minds the loss by oxidation is more important than any of the subjects he refers to. We would suggest that Mr. Peters open the correspondence by giving his own experience with the Smith furnace, stating fuel consumption per 24 hours, and considering quality as well as quantity of fuel. In conclusion, it might not be amiss to say that to cover the objection urged to our record we are prepared to contract to erect complete plants under a guarantee that we will use but a certain quantity of coal per 24 hours to run the furnace, thus removing all element of uncertainty as to amount of coal used to keep furnace up over night on single-turn mills, and displacing the question of tonnage entirely, which is too largely governed by local circumstances to be a reliable basis for figures. Yours truly,
ALEXANDER LAUGHLIN & Co.

CLEVELAND, January 1, 1889.

The Charcoal Furnaces on January 1st.

We print below our monthly report of the status of the charcoal furnaces on the first of the current year.

Charcoal Furnaces January 1.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New England.....	14	8	905	6	495
New York.....	10	3	376	7	570
Pennsylvania.....	23	5	450	18	624
Maryland.....	23	4	347	19	250
Virginia.....	23	3	166	20	780
West Virginia.....	13	0	0	13	165
Ohio.....	13	2	585	11	710
Kentucky.....	13	2	208	11	0
North Carolina.....	9	1	80	8	80
Tennessee.....	2	0	1,060	2	870
Georgia.....	10	3	1,579	7	468
Alabama.....	25	12	3,813	13	3,010
Michigan.....	1	0	0	1	190
Minnesota.....	1	0	557	1	320
Missouri.....	10	4	1,455	6	810
Wisconsin.....	2	1	120	1	148
Texas.....	1	0	0	1	230
California.....	1	1	270	0	0
Washington Ter.....	1	1	270	0	0
Oregon.....	1	1	270	0	0
Total Jan. 1.....	199	67	11,948	102	9,822
Total Dec. 1.....	199	71	12,386	98	9,397
Total Nov. 1.....	199	73	12,724	96	8,941
Total Oct. 1.....	175	71	11,619	104	9,083
Total Sept. 1.....	178	67	11,243	109	10,004
Total Aug. 1.....	178	65	11,187	111	10,065

In New York Millerton went out in December, and will remain idle until prices are more satisfactory. In Maryland Muirkirk is at work. The product of the furnaces for the second half of 1888 was 6322 gross tons. In Virginia the total product for the same period was 6225 tons. So far as is known preparations for the coming season include the blowing in of the following furnaces: Reed Island, February 15; Cedar Run, April 15; Beverly, May 1; Speedwell, May 15, and White Rock, April. In Ohio Mt. Vernon went out on the 4th inst., and Bloom on the 10th, the latter for relining, which will keep it idle till March. In Michigan Peninsular continues in blast. The total output of the furnaces reported by all but one company was 86,252 tons. Estimating the missing stack at 5500 tons, we reach a total of 91,752 tons. In the South, Standard, of Tennessee, now known as Warner No. 2, will go in on February 1st. No. 2 Nashville, a new furnace, is to be put in this month. It has been out only because the boiler capacity of the plant was not great enough to run both, one having been at work with coke as a fuel for some time past. In Alabama Gadsden went out on the 22d ult., and Tecumseh was banked in the beginning of the year. Rock Run, just rebuilt and refitted, has made its best run thus far lately. In Texas Old Alcade furnace blew out in the middle of December, to resume on January 21.

Washington News.

(From Our Regular Correspondent.)

WASHINGTON, D. C., January 15, 1889.

The tariff debate in the Senate is now on the homestretch. One week from today the vote will be taken, and the question, so far as the Senate is concerned, will be disposed of. Since the reassembling of Congress the Senators have not manifested a very lively interest in the subject. The Republicans having carried the election, the incentive to agitation for political effect no longer exists. The members of the Finance Committee have kept up their interest as a matter of pride in the completion of their work. The rest of the Senators, as a rule, have given such attention as local interests demanded. Much delay has been occasioned during the debate in hunting up a quorum when votes have been demanded. In view of the increasing indifference, Senator Edmunds addressed a letter to the Republican Senators, requesting them to be in their seats during these closing days of the discussion, in order to press the consideration of the bill to completion, so that there may be no reason for an extension of the time for taking the vote. The bill has been gone over to the end, and some unsettled points will now be taken up and disposed of. The Senators are very generally applying themselves to the demands of the bill, and from present appearances will be ready to take a vote at the time agreed upon.

At a conference of Senators an understanding has been reached which will secure a full Republican vote for the bill. The only serious point of disagreement has been on the sugar schedule, and that will be so reconciled as to prevent any break in the party vote. It is not probable that the bill will receive any Democratic support unless it should be the vote of Brown, of Georgia. While some features might be acceptable, there are enough otherwise to give a reasonable ground of justification for voting against it as a partisan measure. The management of the Democratic side of the discussion has been unexpectedly vigorous and efficient. The illness of Senator Beck gave rise to much apprehension that there would be no one to take his place in the leadership of the opposition. The Democratic members of the Committee on Finance, except Mr. Beck, were not sufficiently familiar with the subject to do so. Senator Voorhees, of Indiana, is not disposed to array himself against some degree of opposition. Senator McPherson, of New Jersey, had a contest for re-election on hand. Harns, of Tennessee, had his re-election to look after and was a pronounced free trader, and Vance knew less on the question than his colleagues. As a result Senator Vest, of Missouri, not a member of the committee, came to the rescue and has gained a decided reputation for himself and rescued his party in the Senate from permitting the opposition to go by default. Senator Vest never made the tariff a specialty in his study of national questions, but in this emergency he carried the opposition along by devoting the hours of adjournment to the study of the points which would be taken up next. The Senator always had a reputation as a first-class debater, but in this crisis he fairly outdid himself.

The following is the authorized presentation of the amendatory proposition submitted by Senator Allison, chairman of the sub-committee, in lieu of the sections relating to the duty on tin plate:

Sheets of iron or steel, common or black, including all iron or steel commercially known as common or black taggers' iron or steel, and skelp iron or steel, valued at three cents per pound or less, thinner than No. 10 and not thinner than No. 20 wire gauge, one cent per pound; thinner than No. 20 wire gauge and no:

thinner than No. 25 wire gauge, one and one-tenth cents per pound; thinner than No. 25 wire gauge and not thinner than 20 wire gauge, one and three-tenths cents per pound; thinner than No. 20 wire gauge, one and four-tenths cents per pound; corrugated or crimped, one and four-tenths cents per pound; provided, that all common or black sheet iron or sheet steel not thinner than No. 10 wire gauge shall pay a duty as plate iron or plate steel.

All iron and steel sheets or plates, and all hoop, band or scroll iron steel, excepting what are known commercially as tin plates, terne plates and taggers' tin, and hereafter provided for, when galvanized or coated with zinc or spelter, or other metals, shall pay $\frac{1}{2}$ cent per pound more duty than the corresponding gauges of common or black sheet or taggers' iron or steel, and on and after the first day of January, 1890, all such iron and steel sheets, when coated with tin or lead, or with a mixture of which these metals or either of them is a component part, by the dipping or any other process, and commercially known as tin plates, terne plates and taggers' tin, shall pay $\frac{1}{2}$ cent per pound more duty than the corresponding gauges of common or black sheet or taggers' iron or steel.

Sheet iron or sheet steel, polished, planished or glanced, by whatever name designated, $2\frac{1}{2}$ cents per pound; provided that the plate or sheet or taggers' iron or steel, by whatever name designated, other than the polished, planished or glanced herein provided for, which has been pickled or cleaned by acid or by any other material or process, or which is cold rolled, shall pay one-quarter of 1 cent per pound more duty than the corresponding gauges of common or black sheet or taggers' iron or steel.

Sheets or plates of iron or steel, or taggers' iron or steel coated with tin or lead, or with a mixture of which these metals or either of them is a component part by the dipping or any other process, and commercially known as tin plates, terne plates and taggers' tin, 1 cent per pound until January 1, 1890.

The Senate has also incorporated the sugar bounty provision, paying 1 cent a pound on all sugar manufactured from cane, sorghum or beets within the United States until April, 1900. The bounty is to be paid annually from the duties collected on foreign sugars. This is a radical measure and not as a rule popular among the people. The reduction of 50 per cent. on sugar would reduce the revenues about \$80,000,000. The bounty was simply a compromise and necessary to secure the support of Senators Stanford, Ingalls and Plumb. If the bounty scheme should become a law it will open a very new and very troublesome element in future partisan economic discussion.

The resolution of Representative Cole, referring a proposition to repeal certain portions of the Internal Revenue tax to the Committee on Appropriations, carried by an overwhelming vote, was one of the most direct snubs which any committee has had for years. The proper committee would have been Ways and Means, but, by the vote of the Democratic House, the question was taken out of the hands of Mr. Mills and was deliberately turned over to Mr. Randall. That gentleman will report a bill very soon and will take the leadership. On this proposition he will have a majority of the House with him, and will, in the passage of an internal revenue repeal bill, secure the adoption of the only measure which will have a reasonable prospect of concurrent action.

The Audubon Monument.—A committee appointed by the New York Academy of Sciences, with committees from the scientific societies of New York and vicinity, is endeavoring to raise funds for a monument to the great naturalist, Audubon, who lies buried in Trinity Cemetery. Some years ago a number of gentlemen, noticing that his remains were buried in a part of the Trinity Cemetery likely to be interfered with by the cutting through of a street, Prof. T. Egleston, Chairman of the Audubon Committee, induced the authorities of Trinity Cemetery to transfer the remains to a more prominent place, and to construct a new vault for the purpose. It was then suggested that a monu-

ment be raised over his remains, and a committee was appointed for the purpose. The committee have been soliciting subscriptions for some time. They have just issued a portrait of Audubon which will be given to every subscriber of \$1 and upward. As Audubon lived and died in New York, and was the first as well as the greatest American ornithologist, it is hoped that the money for erecting the monument, about \$10,000, will be raised.

Recent Customs Decisions.

The Secretary of the Treasury has rendered the following decisions under the Customs laws affecting imports of metals and manufactures:

CERTAIN JAPANNED WARE NOT HOOKS AND EYES.

In appealing from an assessment of 45 per cent. ad valorem, the appellants claiming duty as plated or gilt articles and japanned-ware, the Secretary says: "It appearing from the special report of the appraiser that the merchandise in question consists of hooks and eyes, some of which have been coated with Japan varnish, while the rest have been tinned and coated with lacquer, none of them being known commercially as japanned-ware or as plated or gilt articles, the claim of the appellants is hereby rejected."

DUTY ON STEEL CLASPS.

On an appeal from duty at 45 per cent. ad valorem, appellants claim purse buckles at 25 per cent as jewelry, and purse frames at 35 per cent. for pocket books. The Secretary, in affirming the assessment of 45 per cent., says: "From your report and that of the appraiser it appears that the entry did not embrace any buckles or purses, but certain clasps composed of steel, with small steel chains attached for ornamentation, which are used in the manufacture of purses, and were classified as manufactures of steel. An examination of the samples submitted shows that the articles are parts of purses, and the Department is of opinion that they cannot be properly classified by assimilation to pocket-books or purses, inasmuch as they are not completed articles, and in their present condition are not intended for any use other than as materials."

CERTAIN FRAMES DUTIABLE AS METAL.

The Secretary, affirming a duty of 45 per cent. on certain frames, says: "It appears from the report of the appraiser and an inspection of the sample submitted, that the merchandise in question consists of frames for triplicate mirrors. The frames are in three parts, each being double—that is to say, an outside frame of wood and an inside frame of metal which is secured to the wooden frame and is intended to hold the glass. The metal, which is not plated, being of material importance in the construction of the article, as well as of considerable value, duty was assessed at the rate provided for manufactures in part of metal and in accordance with Department's decision."

DUTY ON ALUMINIUM POWDER.

On an appeal from 45 per cent. on so-called aluminium bronze powder, claimed to be dutiable at 15 per cent. as bronze powder, the Department says: "The appraiser reports that the article is a powder composed wholly of aluminium, and commercially known as 'aluminium powder,' and not as 'bronze powder;' that it is not adapted to the same uses as bronze powder, and that bronze powder is never made of the finer metals, such as aluminium, platinum, gold or silver, but of the common metals, such as brass, tin or copper. The Department is of the opinion that the powder in question was properly classified

as a manufacture of aluminium, and your assessment of duty thereon is hereby confirmed."

Southern Pig Iron Contracts.

Thomas H. Carter, commissioner of the Southern Railway and Steamship Association, has issued the following circular, under date of January 9th: At a meeting of lines interested in pig iron traffic from Southern furnaces, held at Atlanta, Ga., December 18th, 1888, the following was adopted:

Moved, That the commissioner be requested to advise all furnace companies that under the agreement of June 14th, 1888, contracts will only be protected on sales to actual consumers of the iron, and that billing orders that are now out, covering sales to commission agents, in all cases where the actual consumers are not shown on request from the commissioner, be cancelled for the unexpired shipments.

The agreement of June 14th, 1888, referred to was practically a renewal of the agreement then in effect, as published in our Circular Letter, No. 22, Series 1887-8, copies of which have been furnished you. Furnace companies in whose favor billing orders are now in effect for shipments to commission agents have been furnished abstracts of the same, and notified that the orders will be withdrawn unless the actual consumers of the iron are shown.

The secretary of the Cincinnati Corrugating Company writes us some further particulars in regard to the recent purchase by his company of the machinery, good will, &c., of the iron-roofing firm of Caldwell & Co. The latter was established in Cincinnati over 30 years ago, being the oldest concern in this line in the West, and among the oldest in the whole country. They were engaged principally in the manufacture and sale of the Outcalt patent elastic joint iron roofing, for which they held a very substantial trade, one that stayed with them for years, and until the death of the senior member of the firm, which took place a few months ago. Some of the oldest work alluded to in the Corrugating Company's well-known circular, "Life of an Iron Roof," was of the Outcalt patent, and put on by this firm. One of the strong points claimed for this style of roofing is that there are no nails exposed to the weather. However, the firm in question labored under the great disadvantage of not being able to obtain the steel sheets, now available for work of this kind.

According to dispatches received at the Navy Department, Washington, from Lieut. Cowles, at Philadelphia, the new dynamite cruiser Vesuvius, at the third official trial made on the 10th inst., attained a speed of 21.64 knots an hour, or 24.88 miles. This exceeds the speed called for by the contract by 1.64 knots, and closely approaches the best time made by torpedo-boats in Europe. The trial took place in deep water in Delaware Bay over a two and one-half mile course, the vessel running back and forth.

Claus Spreckels expresses the opinion that California, Oregon and Washington Territory can produce 1,500,000 tons of sugar annually. He sees no reason why Indiana, Kansas, Iowa, Illinois, Missouri, and other States of the Union cannot produce their own sugar, and the United States be able to grow not only the sugar required for domestic consumption, but also become a large exporter, provided the tariff remains untouched. The result of the season's work at Spreckels' Watsonville factory, in California, established less than a year ago, was 1640 tons of sugar, which netted \$30,000 profit, or nearly \$20 per ton.

TRADE REPORT.

Chicago.

Office of *The Iron Age*, 95 and 97 Washington street, CHICAGO, January 14, 1889.

Pig Iron.—Buyers of Coke Pig Iron are very apathetic, and as stocks are accumulating rapidly at many furnaces sellers are becoming anxious and are soliciting orders eagerly, with the usual result. Prices are declining, and the market is now so unsettled that it is difficult to make an exact quotation. Some dealers are advising their customers not to purchase beyond their immediate requirements, but to buy only from hand to mouth until something like a firm basis of values is struck. These dealers believe that the decline will continue until a number of furnaces are obliged to go out of blast and the production is seriously curtailed. The point at which the manufacture of Pig Iron ceases to be profitable at some furnaces has nearly been touched, and already their owners are discussing the probability of an early suspension of operations. The limited volume of trade in Coke Pig Iron is almost entirely confined to the local furnaces in the present condition of the market. Southern and Ohio makers are unable to compete with them in price. The Ohio furnaces, particularly, are badly handicapped by the recent advance in freights. The manufacturers of that State, though worsted in their first effort to have the new rates reduced, have not abandoned all hope, but believe that they will shortly be able to secure an abatement of at least 40¢ per ton, which will help them considerably in retaining their hold on the market. Lake Superior Coke, No. 1 Foundry, is now selling at \$17 @ \$17.50, No. 2 at \$16 @ \$16.50, and No. 3 at \$15 @ \$15.50, cash, f.o.b. Chicago, but a very weak feeling exists among the makers. American Scotch (Blackband) No. 1, is quoted at \$19.50 @ \$20.50, cash, but these prices are merely for small lots. Jackson County Silvery No. 1 is held at \$18, cash. Other Ohio Soft Irons are available at \$17 @ \$18, cash. Lake Superior Charcoal is quiet, but is more firmly held than other kinds of Pig Iron, occupying a stronger position in the trade. It is quoted at \$20 @ \$20.50, cash. Numerous inquiries are in the market, but the manufacturers are somewhat in doubt as to whether they should contract very freely for future delivery, the absence of snow interfering seriously with the preparation of a fuel supply for the season. Quotations on Southern Coke Iron are nominally as last reported, but sales are being pressed and prices are very weak.

Bar Iron.—A gradual weakening of prices is occurring all along the line. The Mahoning Valley mills are generally holding out for 1.60¢ at mill, half extras, for Common Bars, equal to 1.73¢ Chicago, but it is intimated that on good specifications this price would be shaded. How much it would be necessary to cut it to get a good order can be inferred from the fact that other mills recently quoted 1.70¢ without success. Local mills name 1.70¢ @ 1.75¢, half extras, as their price for Mill lots, according to quantity. Orders are scarce, but an abundance of work is in prospect, which should soon develop into business. Stores quote 1.90¢ @ 2¢ for small lots, according to quantity and quality.

Structural Iron.—The local bridge builders have heavy contracts in view, which will probably be in shape for the purchase of material within the coming 30 days. Architects are also very busy on plans of houses, including a very considerable number of large structures, which

give promise of an active season in that line as soon as spring opens. Contracts for Beams are now in sight aggregating from 2000 to 3000 tons. But while the outlook is thus encouraging, everything is very quiet at present. Quotations on Mill lots are as follows, f.o.b. Chicago: Angles, 2.15¢; Universal Plates, 2.20¢; Tees, 2.60¢ @ 2.65¢; Beams and Channels, 2.90¢. Small lots from store are quoted at 2.35¢ @ 2.50¢ for Angles; 2.70¢ @ 2.75¢ for Tees, and 3.50¢ for Beams. Car Truck Channels are quotable at 2.30¢ in carload lots. Large orders have recently been placed at a considerable reduction on this price.

Plates, Tubes, &c.—Plates are very quiet and prices are weak. Sales from store are being made at the following rates: Sheet Iron, Nos. 10 to 14, 2.50¢; Sheet Steel, 3¢ @ 3.50¢; Tank Iron, 2.40¢; Tank Steel, 2.60¢ @ 2.75¢; Shell Iron, 3¢; Shell Steel, 3.12½¢; Flange Iron, 4¢; Flange Steel, 3.50¢; Fire-Box Steel, 4.75¢ @ 5.75¢; Boiler Rivets, 4¢ @ 4.25¢; Ulster Iron, 3.75¢. Boiler Tubes, 62½¢ off.

Sheet Iron.—No. 27 Common Black is now quoted at 2.80¢ @ 2.85¢ at mill, equal to 2.95¢ @ 3¢, f.o.b. Chicago, for carload lots, with light sales. The prominent Sheet mills are still running double turn on old orders, and, as they expect a renewal of contracts much earlier than usual this season, they look forward to making the entire circuit of the year on double turn. Small lots from store are selling on a basis of 3.30¢ for No. 27.

Galvanized Iron.—Although the warehouses of manufacturers' agents show stocks as badly broken as ever, and desirable sizes are in greater demand than the supply, jobbers are quoting small lots of Juniata at 65¢ off and Charcoal at 65 and 2½¢ off. The manufacturers have formed an association and propose to control the price hereafter. It would not be surprising to see a sharp advance in the near future.

Merchant Steel.—Advices were received here on the 11th inst. of the dissolution of the association. The special combinations controlling Plow Steel, Rake-Tooth Steel and File Steel are understood to be unaffected, and remain intact. Prices show no change as yet, but quotations continue as follows: Bessemer Bars, 2.80¢; Tool Steel, 8.50¢ @ 9.50¢; Specials, 13¢ @ 25¢; Crucible Spring, 3.75¢; Open-Hearth Spring, 2.50¢ @ 2.70¢; Open-Hearth Machinery, 2.40¢; Tire, 2.25 @ 2.50¢; Sheet, 7¢ @ 10¢.

Steel Rails.—Nothing has occurred in this market worthy of note during the past week beyond the establishment of a general sales agency for the three Chicago mills, referred to in greater detail elsewhere. Inquiries are coming forward from which a fair amount of business is expected to develop very shortly. Quotations are firm at \$30.

Old Rails and Wheels.—The past week witnessed much greater activity in Old Iron Rails than has been the case for a long time. Large sales were made at prices varying from \$22.62½ down to \$22, and stocks in this vicinity have been pretty well cleaned up for the present. Old Steel Rails are lower, sales of long lengths having been made at \$17 and short lengths at \$14.50 @ \$15. Old Car Wheels are in better demand and prices are stiffening. Offers of \$19 have been declined, holders asking \$19.50, while in some quarters an early advance to \$20 is expected.

Scrap.—The week has been generally quiet, although some dealers have managed to work off a considerable quantity of stock in the belief that prices will be lower. Mixed Country Scrap is now worth

about \$14. Carefully selected Scrap is offered at the following rates by city dealers, per ton of 2000 lb.: No. 1 Wrought, \$20; Track, \$19; No. 1 Mill, \$14.50; No. 2 Mill, \$10; Horseshoes, \$18.50; Axles, \$25; Machinery Cast, \$18.50 @ \$14; Stove Plate, \$10; Cast Borings, \$9; Wrought Turnings, \$10.50 @ \$11; Axle Turnings, \$12.50 @ \$13; Coil and Leaf Steel, \$15; Tires, \$15.50; Mixed Steel, \$10.50 @ \$11.

General Hardware.—The Shelf Hardware trade has opened up very well, the traveling men of all the local wholesale houses now being on the road and making their work felt thus early. The prospects for business are reported very flattering. The Heavy Hardware houses also report a very encouraging start for the year.

Nails.—Cut Nails are improving in the direction of greater firmness in price, although at present the manufacturers are making but light sales. A few large dealers who failed to lay in stocks when prices were low are now in the market, but they are buying sparingly at the advanced rates now asked by all the manufacturers. They quote slightly higher prices for March delivery than for January and February. The advance of 2½¢ per keg freight from Wheeling adds that much to the cost of Nails laid down here. Jobbers are selling small lots of Steel Nails at from \$2 to \$2.10, and mixed carloads at \$1.95 and cartage. Wire Nails are quoted at \$2.55 from stock, but influences are at work which may cause these figures to be lowered if they continue for any length of time.

Barb Wire.—Jobbers report a very good demand springing up, but it is not sufficiently strong to cause any advance in price, and no change is anticipated in the near future. Small lots of Painted are still quoted at 2.90¢ and Galvanized at 3.60¢, with the usual abatement on carloads.

Pig Lead.—Purchases of Refined are reported for January and February delivery to the extent of 700 tons, and of Common about 200 tons, at prices ranging from 3.60¢ to 3.65¢. Consumers generally have fair stocks.

Charles Himrod & Co., 115 Dearborn street, Chicago, have issued their annual chart showing the course of local prices of Pig Iron. The chart just at hand covers 1882 to 1888, and shows the monthly fluctuations on Lake Superior Charcoal, Lake Superior Coke, Ohio Blackband and Southern Coke. Appended to the diagram are the following remarks: "Consumption of Pig Iron during the year 1888 has been about the same as the production, say 6,000,000 tons, or about 600,000 tons less than 1887. About 1,000,000 tons less Pig Iron was manufactured into Bessemer Steel, so that about 400,000 tons more was used for other purposes. As our annual capacity for production is so much larger than the past year's requirements, prices at the close of the year are lower and weaker than at the opening. With a capacity for 1889 of 7,500,000 tons, the prospect for immediate advances in prices seems somewhat uncertain."

Julian L. Yale has been appointed general sales agent for the entire product of Steel Rails of the North Chicago Rolling Mill Company, the Union Steel Company and the Joliet Steel Company. His office is located in the Rookery Building, Chicago, room 768. Mr. Yale was formerly a resident of Cleveland, where he was engaged in the railway equipment and supply business, and has a wide acquaintance in railway circles. From this time forward all contracts for Steel Rails to be made by the Chicago mills will be negotiated through him.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St.,
PHILADELPHIA, Pa., January 15, 1889.

Pig Iron.—The continued dullness is beginning to have its affect upon prices, which, while nominally unchanged, are at least 50¢ per ton lower on foundry grades. Mill Irons are not effected to the same extent, but they are dull, and under pressure to realize would have to be shaded considerably for large lots. Consumption is large, but new contracts are both few and unimportant, as buyers are not prepared to bid for large lots. A great deal of Iron is being taken on former contracts, and in some cases deliveries are made with the understanding that buyers will have the benefit of any reductions that may be made within the next 30 days. It is also quite likely that in some cases private arrangements may have been made by which prices are not to be made public, so as to enable sellers to maintain quotations to the smaller class of trade. In fact, a variety of expedients have been employed to postpone—if not obviate—the necessity for an all-round reduction, but it will be impossible to sustain such a course for any length of time. The aggressive competition from the West and South has now reached a point which will compel local makers either to reduce prices or blow out some of their furnaces. A considerable amount of Iron could still be sold at \$16 for Gray Forge, and at \$18 @ \$18.50 for No. 1 Foundry, but with a constant scattering of Southern and Western Irons, a little here and a little there, and once in a while a big lot somewhere else, it is simply impossible that the entire local output should be taken without some adjustment of prices in accordance with the changed conditions. Compared with last week Western and Southern Irons are from 50¢ to \$1 per ton lower, with several transactions closed at the reductions named. Under these circumstances exact quotations are hardly possible. It is easy enough to quote asking prices, but what would be accepted as a selling price for round lots is another thing. The weakness is not due to any material falling off in consumption, but rather to the increase in production, the accumulation of stocks during the Christmas holidays and to increased pressure to realize by furnaces at a distance, besides which it is always hard to sell on a falling market, even though material may be required just as much as at any other time. A large consumption is regarded as a matter of certainty during the coming spring, and, while prices cannot go much lower, there is evidently very little confidence in the quotations now current, which are \$18 @ \$18.50, at tide, for No. 1 Foundry; \$17 @ \$17.50 for No. 2, and \$15.75 @ \$16 for Gray Forge. Southern Irons are offered at \$15, ex-ship, for Gray Forge, \$16 @ \$16.50 for No. 2, and \$17 @ \$17.50 for No. 1, with transactions at the inside quotations.

Foreign Iron.—Entirely nominal at last week's quotations, viz.: Bessemer, \$20, c.i.f., duty paid, and 20 % Speigeleisen, \$27.

Blooms.—Prices are irregular and are said to be shaded considerably on bids for large lots. Quotations nominally as follows: Steel Nail Slabs, \$28.50 @ \$29, at mill; Billets, from \$32 to \$36, according to analysis; Charcoal Blooms, \$52 @ \$54; Run-out Anthracite, \$42 @ \$44; Scrap Blooms, \$32.50 @ \$34 per "bloom" ton of 2464 lb.

Bar Iron.—The market is irregular, and on all but the best makes exceedingly dull. A few special orders have been on the market, but special brands were required, so that comparatively high prices were realized, say 1.85¢, with full extras.

There is a great deal of good Iron for sale at 1.75¢ @ 1.8¢, and common Iron at 1.6¢ @ 1.65¢, but the demand is not in proportion, so that the general report of the market is that it is distressingly dull. Skelp Iron is likely to be wanted in large quantities, but as yet no direct offers have been made. Prices are nominally 1.85¢ for Grooved and 1.95¢ for Sheared, but Western quotations are said to be so much more favorable to buyers that the chances for business in this vicinity are not likely to be good until the West is more fully employed.

Muck Bars.—The market is dull and lower, with sellers at \$20.50 at mill, or \$28 @ \$28.50, delivered to consumer. The offerings are large, and bids not easily obtained except for small lots.

Plate and Tank Iron.—The market is in a most depressed condition, and, while prices are nominally unchanged, cuts of 10¢ @ 15¢ per 100 lb are by no means infrequent when fair-sized orders are offered. Steel Plates are the weakest, but as so much depends on requirements as to tests, &c., we can only quote in a general way as follows: 2¢ @ 2.1¢ for Ordinary Plates and Tank plates, 2.1¢ @ 2.2¢ for Universal Plates; Shell, 2.4¢ @ 2.5¢; Flange, 3.5¢; Fire-Box, 4¢; Steel Plates, Tank and Ship Plate, 2.2¢ @ 2.3¢; Shell, 2.7¢; Flange, 3¢ @ 3.1¢; Fire-Box, 3.1¢ @ 4.1¢.

Structural Iron.—Business appears to be gradually opening up, although, as yet, the amount actually closed has not been important. Several matters are under consideration which will require a great deal of Iron, sooner or later, with a fair probability that at least some of them will be on the market before the end of the month. In the meantime some of the mills are fairly busy, while others are doing very little. Prices are easy, and likely to remain so until work becomes more plentiful. Quotations, nominally, as follows: Bridge Plate, 2¢ @ 2.1¢; Angles, 2¢ to 2.1¢; Tees, 2.4¢ to 2.6¢; Beams and Channels, 2.8¢ for Iron or Steel.

Sheet Iron.—A great deal of business is offered to manufacturers for summer delivery, but at prices too far from the asking rates to lead to business. Small lots sell at quoted rates for the best makes, but the amount is not important, and sellers prefer waiting rather than accept the terms usually offered. Quotations for small lots:

Best Refined, Nos. 26, 27 and 28.... 3½¢ @ 3½¢
Best Refined, Nos. 18 to 25.... 3¢ @ 3½¢
Common, ½¢ less than the above.
Best Bloom Sheets, Nos. 26 to 28.... 4½¢ @ 4½¢
Best Bloom Sheets, Nos. 22 to 25.... 4¢ @ 4½¢
Best Bloom Sheets, Nos. 16 to 21.... 3½¢ @ 3½¢
Blue Annealed..... 2.7¢ @ 2.9¢
Best Bloom, Galvanized, discount..... 62½¢ %
Common discount..... 67½¢ %

Merchant Steel.—Orders have come in quite freely, and in some instances a decided increase of business is noted. Prices are unchanged—viz.: Tool Steel, 8½¢; Machinery, 2.6¢; Crucible Spring, 4½¢; Crucible Machinery, 5¢; Best Sheet Steel, 10¢; Ordinary Sheet, 8¢.

Steel Rails.—There is very little report in the way of new business. There is a good deal of inquiry and some bids for fair-sized lots, but not on terms such as are acceptable to sellers. Small lots are taken at \$28 at mill, and the disposition is to maintain that as a firm quotation, as there is a growing impression, that a turn for the better cannot be delayed much longer.

Scrap Iron.—There is more disposition to do business and prices appear to be pretty well held, as follows: \$20.50 @ \$21 for cargo lots; \$21.50 @ \$22 for carload lots, delivered, or for choice \$22.50; No. 2 do., \$14 @ \$15; Turnings, \$18 @ \$14; Old Steel Rails, \$20 @ \$21; Cast Scrap, \$15 @ \$16; do. Borings, \$9 @

\$10; Old Fish Plates, \$25 @ \$26; Old Car-Wheels, \$17 @ \$18, Philadelphia, or its equivalent.

Old Rails.—Prices are firm, although there is no great demand. The offerings are very light, however, and as stocks are in strong hands prices are likely to be maintained. Asking prices \$23.50 @ \$24, Philadelphia, according to delivery, with buyers at about half a dollar less money.

Wrought-Iron Pipe.—There is a great deal of business on the market, but prices are irregular and on large orders increased discounts are usually obtained. Nominal discounts are as follows: Black Butt-Welded, 52½ %; Galvanized do., 42½ %; Black Lap-Welded, 62½ %; Galvanized do., 52½ %; Boiler Tubes, 60 %.

Nails.—Are as dull as usual at this season, but it is believed that when business starts up it will be at higher figures than have ruled for some time past. Several leading mills are closed and will probably remain closed unless prices improve. Store prices are from \$1.90 to \$2, with slightly lower figures for carload lots.

Mr. Paul Thompson (of the late W. H. Walbaum & Co.), in connection with Mr. John W. McGennis, formerly superintendent of the North Chicago Rolling Mill Company, have formed a partnership and will continue the Iron Commission business at 206 South Fourth street, Philadelphia, under the firm name of W. H. Walbaum & Co.

Pittsburgh.

Office of *The Iron Age*, 77 Fourth Ave.,
PITTSBURGH, January 15, 1889.

The general Iron and Steel business continues very dull, and the fact that almost everything in these important industries has been declining in value is not without its effect in curtailing business, as buyers, while this continues to be the case, will buy only as their immediate necessities require. It is a characteristic of buyers both of Iron and Steel of late years to hold off at the same time and then buy together. While this is good policy in some respects, it is bad in others. They frequently buy and sell at the wrong time. However, the policy once so common of carrying from two to four months' stock has been pretty well discarded. It was then a necessity, but now, in view of the greatly increased railway facilities, it is not, and jobbers and large consumers order always as they require. Now and again, however, when prices are weak and tending downward, as has been the case for some time past, demand falls off, and will not improve much until there is a reasonable assurance that the lowest point has been reached. While business is dull at present, the situation as regards the great interests in question is by no means discouraging; on the contrary, there is every reason to believe that the Iron and Steel business of 1889 will be prosperous.

Our manufacturers generally are a good deal exercised in regard to the excessive price demanded for natural gas, as well as the increasing number of restrictions issued by the gas companies in the consumption of the same. There is no failure of the supply, nor is such a thing at all probable, but the gas companies say they have been furnishing gas too low; they also claim that there has been a very great wastage on the part of large consumers. Some of our manufacturers aver that if the present policy of the natural gas companies is continued they will discard the use of gas and go back to coal.

The Monongahela River coal mines are still standing idle, and it looks now as if they would not be started before March. This is unfortunate, as it keeps some 6000 miners out of employment.

Pig Iron.—The dullness noted for some weeks past continues, but it is believed that there will soon be a change for the better. Just as soon as consumers can be assured that the market will go no lower there will no doubt be a change for the better, as they are mostly low in stock and will want to replenish. As it is now and has been for several weeks past, buyers are not buying a ton more than they can possibly help. City furnaces are selling most of the Iron that is being bought just now. Shenango and Mahoning valley furnaces are offering very little now in this market, claiming that they can do much better elsewhere. It is generally admitted that present prices, under the most favorable circumstances, cover little more than actual cost, and it looks as though—if the cost of production cannot be reduced by cheaper Ore, Coke, &c.—the market will sooner or later have to stiffen up. The situation at present is anything but satisfactory to furnace men. Prices may be fairly quoted as follows:

Neutral Gray Forge.....	\$15.00 @ \$15.25, cash.
White and Mottled.....	14.50 @ 15.00, "
All Ore Mill.....	16.00 @ 16.25, "
No. 1 Foundry.....	17.50 @ 17.75, "
No. 2 Foundry.....	16.75 @ 17.00, "
No. 2 Charcoal Foundry.....	21.00 @ 22.00, "
Cold Blast Charcoal.....	25.00 @ 26.00, "
Bessemer Iron.....	17.00 @

In regard to Bessemer Iron there have been no sales reported for over a week, and, while it is very dull, so far as we can learn no well-known reliable brands can be had under \$17, cash. No. 1 brands of Neutral Gray Forge sold during the week under review at \$15.25, cash.

Muck Bar.—There is little or no demand, and we have to report a continued dull market, with prices weak and drooping. It is now offered at \$28, cash, although there are makers who will not sell below \$28.50.

Ferromanganese.—Sale 100 tons 80 % at \$55, cash; Spiegel, 20 %, \$27.50 @ \$28, cash.

Manufactured Iron.—The demand continues light and prices are weak and irregular. We continue to quote Bars at 1.75¢ @ 1.80¢, 60 days, 2 % off for cash. Plates 2.20¢ @ 2.25¢; No. 24 Sheet 2.85¢ @ 2.90¢. For desirable orders the above rates would no doubt be shaded, as some mill owners are desirous for business. Skelp Iron is hard to quote, as it is being sadly cut; Grooved is quoted at 1.75¢ @ 1.80¢, and Sheared at 1.95¢ @ 2.00¢.

Nails.—There is nothing doing here and it is not likely that there will be as long as buyers can do so much better in the Wheeling district. The Wheeling card is 10¢ per keg below that of Pittsburgh; the latter are refusing to sell below a 1.90¢ basis for 12d to 40d, 60 days, 2 % off for cash, while the former are selling upon a basis of 1.80¢.

Wrought Iron Pipe.—The Pipe trade continues dull. Some mills are standing idle, and but few, if any, of those in operation are working up to anything like their full capacity. However, it is probable that there will be an improvement within the next few weeks, although no special activity is looked for until March or April. Prices continue irregular, and are difficult to quote, as each firm makes its own rates. Discounts are about as follows: On Black Butt-Welded Pipe, 52½ and 5 %; on Galvanized do., 45 and 5 %; on Black Lap-Welded, 62½ and 5 %; on Galvanized do., 52 and 5 %; 2-inch Tubing, 13¢ per foot, net; Boiler Tubes, 65 % off list.

Old Rails.—There is no demand, and in the absence of sales it is difficult to give reliable quotations. Some of the brokers intimate that an offer to buy at \$24 would probably be accepted, although the last sale reported was at \$24.50. Contrary to general expectation, the weather has been favorable all the winter for lift-

ing, and this has been an element of weakness, as it has kept up the supply much better than was looked for. The last sales of Old Steel Rails reported were at \$18.50 for short and \$20 @ \$20.50 for long lengths.

Steel Rails.—Heavy Sections are still quoted at \$28, cash, at mill, for lots ranging from 1000 up to 5000 tons. A sale of 5000 tons was reported at the price quoted. As intimated in our last report, it is possible that for a large order the price quoted would be discounted.

Billets, &c.—Bessemer Steel Billets continue dull and we now quote at \$28.25 @ \$28.50; Nail Slabs, \$27.75 @ \$28; Domestic Bloom and Rail Ends dull and weaker. We now quote at \$18.50 @ \$19.

Railway Track Supplies.—Railway Spikes are still quoted at \$2.10, 30 days, free on cars at works in Pittsburgh; Splice Bars, 1.85¢ @ 1.90¢; Track Bolts, 2.80¢ with Square and 2.90¢ with Hexagon Nuts.

Merchant Steel.—Tool Steel remains unchanged at 8½¢ for best brands; Crucible Spring, 4½¢; Crucible Machinery, 5¢; Open Hearth do., 2½¢.

Old Material.—The market in all kinds of Scrap continues dull, and there is so little doing that it is difficult to give reliable quotations. The last sales of No. 1 Wrought Scrap reported were at \$21 @ \$21.25, net ton; Cast Scrap at \$15.50 @ \$16, gross; Old Wheels nominal at \$19.50 @ \$20.

On Monday, the 14th inst., announcement was made at Pittsburgh that Mr. H. C. Frick, president of the H. C. Frick Coke Company, at Pittsburgh, had purchased the interests of the late D. A. Stewart in the firm of Carnegie Bros. & Co., Limited, and had also succeeded to the office of chairman of that firm. This position was occupied by Mr. Stewart before his death some weeks since. As is well known, the firms of Carnegie Bros. & Co., Limited, and the H. C. Frick Coke Company are closely identified with each other, and as a result Mr. Frick will still continue to hold the office of president of the H. C. Frick Coke Company. The following official announcement of the change was issued by Carnegie Bros. & Co., Limited, on Monday, the 14th inst.

Mr. H. C. Frick having purchased Mr. D. A. Stewart's interest in the Carnegie firms, he was unanimously elected Chairman of Carnegie Bros. & Co., Limited, Mr. John G. A. Lieberman retaining the position of Vice-Chairman and Treasurer. The active members of the firm felt that the growth of the business required an increase in the managing force, and as Mr. Frick had so successfully managed the extensive coke interests, it was decided to offer him an interest in the firm and make him one of the active managers. Mr. Frick will continue president of the H. C. Frick Coke Company, of which he is the founder, as the business of these two companies, which are controlled by the same parties, can be advantageously combined.

Mr. Frick entered upon the duties of his new office immediately after the appointment was made.

Chattanooga.

Office of *The Iron Age*, Carter and 9th Sts., CHATTANOOGA, January 14, 1889.

Pig Iron.—The situation can be summed up in a very few words. Some of the furnaces are keeping their yards quite clear of Iron by shipments on old contracts. What there is left over after the monthly shipments on contracts is sold at a concession of 50¢ to \$1 per ton. Other furnaces that are piling up metal are obliged to do so partly for want of cars to make shipments and partly for want of a disposition to sell at present prices, believing that the future will develop higher rates, and some are piling up metal simply because they positively refuse to accept pres-

ent figures, and are able to hold; so it will be seen that it would be quite difficult to give a correct report of the condition of the market. A careful estimate of what the Southern districts will turn out the present year develops the fact that 1889 will exceed 1888 by about 350,000 tons, and in the face of this the question may be asked, What is going to be the result on prices? Should Iron go lower, many of the Northern stacks will probably blow out, which will serve in a measure to equalize production with consumption, and it is so looked upon by many of the Southern producers. At any rate they say that they are willing to continue to blow as long as Pig Iron nets them an average of \$11 on cars at the works. The Gadsden, a comparatively new furnace, has so far made an excellent record by averaging 120 tons per day, about two-thirds Foundry, and of very excellent quality. It is 16 x 75. The very fine weather that has prevailed for the past four weeks has enabled all the furnaces to make exceedingly good runs, and of superior qualities.

Detroit.

WILLIAM F. JARVIS & Co., under date of January 14, 1889, report as follows: There has been a little more activity developed since our last report, and some round lots of L. S. Charcoal have been placed. The demand seems to be for the high numbers and prompt delivery. Mahoning Valley Coke Irons are held firm, but some of the Southern brands are still offered considerably below the regular market. Considering the very large production, it appears remarkable that so little cutting is being done, and it can be accounted for only by the consumption keeping so nearly up to the production. Stocks of L. S. Charcoal are still diminishing, and this is encouraging to makers of this grade, as all other stocks have increased to some extent. We quote for the present as follows:

Lake Superior Charcoal, all numbers.....	\$20.00 @ \$20.50
Lake Superior Coke, all ore.....	19.75 @ 20.25
Lake Superior Coke, cinder mixed.....	18.00 @ 18.50
Standard Ohio Black Band.....	19.75 @ 20.25
Southern No. 1.....	17.75 @ 18.25
Southern Gray Forge.....	15.25 @ 16.25
Southern Silvery.....	17.00 @ 17.50
Jackson County (Ohio) Silvery.....	18.50 @ 19.00
Old Wheels.....	20.25 @ 20.75

Cleveland.

CLEVELAND, January 14, 1889.

Iron Ore.—None of the mining companies have fixed upon their prices for 1889. In the face of a weak and apparently declining Pig-Iron market the furnacemen seem less anxious to push negotiations than was noticeable ten days ago. It is the general opinion among all interested parties that Lake freights will vary but slightly from the schedule of 1888. Notwithstanding the evident lack of all activity in the market it is probable that several quite important sales of new Ore will take place within a very few days. The Ore in question is a high-grade Bessemer and the price paid for it will serve as a basis for estimating the selling rates for nearly all kinds of Ore during the coming season. About 8000 tons of the Ore now on the docks has been sold during the week and 36,000 tons have been sent to the inland furnaces.

Pig Iron.—Furnacemen are standing up courageously under the somewhat depressing influences now prevailing, and are making no efforts to force sales. It is known that an immense amount of Iron is being consumed, and an active buying movement must come sooner or later. The holiday and inventory seasons of the year still affect the market, the mills not being in readiness to purchase new Iron. The market cannot be said to be either active

or firm, but prices have not been cut, and good business is looked for before February.

Old Rails.—The market is dull, and \$24 @ \$24.50 has been the price paid for all the Old Americans reported sold.

Nails.—Steel Wire Nails have dropped to \$2.50, owing to the animated competition among manufacturers. Steel Nails at \$2 are selling quite freely.

Manufactured Iron.—Common Bar at 1.60¢ forms a basis for the price of all grades of Iron of this variety.

Cincinnati.

Office of *The Iron Age*, Fourth and Main Sts.,
CINCINNATI, January 14, 1889.

Pig Iron.—The local market for Pig Iron has been demoralized during the past week, yet the pressure to sell Iron at the low prices prevailing has been more marked among producers than among agents. Reports are current here of sales which are looked upon as nothing less than sacrifices, and reflect a stampede among furnaces. Yet such is the fickleness of the market that these very transactions, in a few weeks, may be applauded as sales well made. The conditions of the market respecting supply and demand have not changed essentially, but the evidence of an oversupply is more prominent. A local authority remarks: "Values have declined more rapidly since December 10 than in any equal period for years." The weakness has been more apparent in Southern Iron, but the Ohio and Tennessee product has also figured in the decline. A few local buyers have entered the market for 500 and 1000 ton lots, among them being rolling mills and stove manufacturers. In addition, there have been several lots of 1000 and 2000 tons of both Mill and Foundry grades, but there has been an absence of large trades. Several round lots, however, in which local parties are interested, have been sold at near-by points, among them being about 7000 tons at Louisville. No 1 Southern Coke Foundry has been sold at \$15.50 @ \$16; No. 2 do. at \$14.50 @ \$15; Gray Forge at \$13 @ \$13.50; Mottled at \$12.50 @ \$12.75; Open Bright at \$13.75, &c. Car-Wheel Iron, however, has not entered into the market, and prices for it are well sustained. The following are the approximate prices current here at the close for cash, f.o.b.:

Foundry.

Southern Coke, No. 1 (new classification).....	\$15.50 @ \$16.00
Southern Coke, No. 2 (new classification).....	14.50 @ 15.00
Southern Coke, No. 3 (new classification).....	14.00 @ 14.50
Ohio Soft Stone Coal, No. 1.....	16.00 @ 17.00
Ohio Soft Stone Coal, No. 2.....	15.00 @ 16.00
Mahoning and Shenango Valley.....	17.00 @ 17.50
Hanging Rock Charcoal, No. 1.....	21.00 @ 22.00
Hanging Rock Charcoal, No. 2.....	19.00 @ 22.00
Tennessee and Alabama Charcoal, No. 1.....	18.00 @ 18.50
Tennessee and Alabama Charcoal, No. 2.....	17.00 @ 18.00

Forge.

Strong Neutral Coke.....	13.00 @ 13.50
Mottled Neutral Coke.....	12.50 @ 12.75
Gray Forge.....	13.00 @ 13.50

Car-Wheel and Malleable Irons.

Southern Car-Wheel.....	29.00 @ 25.00
Hanging Rock, Cold Blast.....	22.00 @ 25.00
Lake Superior Car-Wheel and Malleable.....	21.00 @ 22.00

Manufactured Iron.—There has been a more active demand from carriage builders, stove men and others, and prices have been well sustained, although an easier tone has prevailed, in sympathy with the continued and rapid shrinkage in prices of Pig Iron.

Nails.—The market has ruled easy in tone and prices have been barely sustained, with little demand: 13 @ 40d sold at \$1.90 @ \$1.95 per keg, with 10¢ rebate in carload lots at the mills; 50 @ 60d 25¢, 10d 10¢, 8 @ 9d 25¢, 6 @ 7d 40¢, 8d \$1,

and 2d \$1.50 per keg more. Steel Nails sell at \$1.90 @ \$1.95, and Steel Wire Nails at \$2.60 @ \$2.65 per keg.

Old Material.—There has been but little doing and an easy tone has prevailed. Buyers have reduced bids on Old Wheels to \$18.50, and Old Rails are not readily sold over \$21.50 per ton, but sellers are not disposed to accept such prices, asking at least 50¢ per ton above these rates.

Louisville.

LOUISVILLE, KY., January 14, 1889.

Pig Iron.—The market has been very active during the past week, with sales at reduced prices. Large blocks of Iron have been sold for delivery during 12 months, the heaviest sales being of off-colored and Mill Irons. It is impossible to tell what is the value of Iron to-day, so different are the views of various furnaces. From some sales made indications point to low prices for some time to come, and even the most conservative furnaces are willing now to make concessions and sell for several months ahead. We will not change quotations of the past week, though these are outside figures, and sales have been made for less money, as it is impossible to tell until the market becomes settled what is the price of Iron. We quote as follows:

Southern Coke, No. 1 Foundry, new classification.....	\$15.50 @ \$16.00
Southern Coke, No. 2 Foundry, new classification.....	15.00 @ 15.50
Southern Coke, No. 3 Foundry, new classification.....	14.50 @ 15.00
Gray Forge.....	14.00 @ 14.50
White and Mottled, different grades.....	13.50 @ 14.00
Silver Gray, different grades.....	13.75 @ 14.50
Southern Charcoal, No. 1 Foundry.....	16.50 @ 17.00
" " No. 1 Mill.....	15.25 @ 15.75
Southern Car-Wheel, standard brands.....	22.50 @ 23.50
Southern Car-Wheel, other brands.....	18.50 @ 20.00
Hanging Rock Coke, No. 1 Foundry.....	16.00 @ 16.50
Hanging Rock Charcoal, No. 1 Foundry.....	20.00 @ 21.50
Hanging Rock, Cold Blast.....	21.25 @ 24.25

New York.

Office of *The Iron Age*, 66 and 68 Duane street,
NEW YORK, January 16, 1889.

Foundry Pig.—The feeling continues one of uncertainty, brought about chiefly by lower offerings of Southern Irons, principally for January and February delivery. Some agents of Southern furnaces ask \$17.50 for No. 1 and \$16.75 for No. 2, delivered on dock, but there is accumulating evidence that \$17 for No. 1 and \$16.25 for No. 2 has been done. The question of the prompt delivery to consumers of Southern Iron contracted for is again becoming vexatious. Delays of weeks at Savannah are frequent. It is evident that the quantity of Iron to be marketed from the Chattanooga and Birmingham districts will not depend upon the ability or the eagerness of the producers to place Iron with consumers in Philadelphia, New York and New England, but that it will be limited by transportation facilities so long as rates remain as low as they now are. We quote standard brands of Northern Iron: No. 1 Foundry \$18 @ \$18.50 and No. 2 \$16.50 @ \$17.

Scotch Pig.—The small lot referred to as having been sent on consignment has been sold at a sacrifice. We quote: Coltness, \$20.50 @ \$21; Shotts, \$20 @ \$20.50; Langloan, \$20 @ \$20.25, Summerlee, \$20.25 @ \$20.50 and Dalmellington, \$19.25 @ \$19.50.

Spiegeleisen.—With the exception of a small quantity of 20 % Spiegel at \$28, no transactions are reported, the market remaining \$28 @ \$29 for 20 % English, and nominally the same for German. Ferromanganese is nominally quoted \$54.50 @ \$55.

Plates.—We quote Iron Tank, 2¢ @ 2.2¢; Shell, 2.25¢ @ 2.4¢; Steel Tank and Ship Plate, 2.15¢ @ 2.25¢; Shell,

2.35¢ @ 2.5¢; Flange, 2.6¢ @ 2.75¢, and Fire-box, 3½¢ @ 4¢.

Structural Iron.—We quote Sheared Plates, 2¢ @ 2.1¢; Universal Mill Plates, 2.1¢ @ 2.2¢; Angles, 2¢ @ 2.10¢; Tees, 2.5¢ @ 2.6¢, and Channels and Beams, 2.8¢ on dock for all sizes.

Bar Iron.—We quote: Carload lots on dock, half extras, Common, 1.65¢ @ 1.75¢; Medium, 1.75¢ @ 1.8¢, and Refined, 1.8¢ @ 2¢.

Steel Rails.—In the East the market has been very quiet, no transactions of any magnitude being reported. It is intimated that \$28, at tidewater, could be done readily, which would be equivalent to about \$27 @ \$27.25 at Eastern mills. Some of the Western works are basing quotations on tidewater delivery. The shipments of the different mills during the year 1888 were as follows:

Gross tons.	Gross tons.
1..... 85,448	9..... 136,029
2..... 82,363	10..... 25,110
3..... 138,946	11..... 126,016
4..... 29,940	12..... 6,599
5..... 114,675	13..... 39,168
6..... 123,310	14..... 3,705
7..... 163,040	
8..... 121,960	Total..... 1,206,279

These figures do not include Light Rails. The total sales for 1889 delivery up to January 1 are reported officially at 434,381 tons, out of a total allotment of 777,000 tons.

Merchant Steel.—There is quite a flow of small orders, but no contracts of any consequence have been closed for season delivery. Prices continue low.

Wire Rods.—There is some inquiry, but buyers and sellers are still apart, the latter asking \$41.50 @ \$42 for German Basic.

Old Rails.—We note sales in 300 and 400 ton lots of an aggregate of 1000 tons of American Tees, at \$23 Jersey City, and \$23.50 delivered to lighter. We continue to quote \$23 @ \$23.50.

Steel Scrap.—Crop Ends, and Billet and Bloom Ends afloat, the quantity being about 500 tons, are being offered at \$21.75 @ \$22.

Track Material.—The Spike market is weak and dull at \$2.10, delivered. We quote Angles 1.85¢ @ 1.9¢.

Coal Market.

The Anthracite Coal market is without animation, complaints being general that the absence of zero weather retards consumption. Meanwhile stocks at all points are for the present amply supplied, both East and West. It is only in the supply of furnace and steam sizes that any activity is noticed. Meanwhile the tendency of prices is to droop, despite the efforts to restrict production, and although the companies affirm that schedule prices are faithfully adhered to by the corporations engaged in mining, it is admitted that considerable Coal mined by individuals finds its way into the market at cut prices averaging something like 25 %. For the week ending January 12 the reported receipts are 640,417 tons, which is nearly up to the average for December, showing that restriction sometimes fails to restrict. For the corresponding week last year the average was 635,076 tons. Since January 1 the aggregate is 1,049,706, against 1,143,196 for the same time in 1888, a decrease of about 94,000 tons. Quotations remain unchanged, viz.: Hard White Ash, Lump, \$4.50; Broken, \$4.15; Egg, \$4.40; Stove, \$4.65; Chestnut, \$4.55; Free-Burning, f.o.b., Broken, \$3.95; Egg, \$4.80; Stove and Chestnut, \$4.65; Pea, \$2.75.

Reading reports for the last week 128,000 tons of Coal, of which 28,000 went to Port Richmond and 19,000 tons to Port

Liberty. The Pennsylvania transported since January 1 139,465 tons of Coal, a decrease of 61,000 tons compared with the same time in 1888.

Bituminous Coal is dull and prices in some instances are said to scarcely return the actual costs. The pool quotation is \$3.25, f.o.b. Clearfield reports for the week, 76,689 tons; Cumberland, 48,439 tons; Beech Creek, 30,004 tons and Pocahontas 32,960 tons.

The mining plant at Pittston, Pa., where 1000 men were employed, has been sold to a syndicate consisting of George B. Newton, of New York, and associates in Philadelphia and Scranton.

The Buffalo, Rochester and Pittsburgh Railroad Company have bought three docks in Buffalo, with a frontage of 1700 feet. The object is to develop and extend the Coal business of the road in Buffalo and to lake ports of the Northwest. The company have also bought 14 acres at Charlotte, Lake Ontario, with docks, shutes, &c., complete for handling Coal. The Coal tonnage of the Lehigh Valley Railroad for the year was 7,950,447 tons of Anthracite and 74,887 tons of Bituminous, making in all 8,025,334 tons, an increase of 1,141,377 tons over the tonnage of 1887 and exceeding that of any other year.

President Corbin, of the Reading, says that but for the blizzard of March that company could have readily produced at least 620,000 tons of Coal over the production for the year 1887.

The first hearing in the suit of Cox Bros. & Co. against the Lehigh Valley Railroad before the Interstate Commerce Commission for discrimination in charges for hauling Coal will take place at Washington on next Friday.

Metal Market.

Copper.—The markets on both sides of the Atlantic have been excessively dull since our last report. In London only 350 tons were sold at a slight advance of 2/6, spot Chili Bars and good merchantable, which are cabled £77. 17/6, futures remaining £78 for both, and Best Selected £79. 10/. Here nothing beyond a sale of 25,000 lb at 17.30¢ for March was done in a speculative way, consumers buying what little they may stand in need of from the syndicate at 16 1/4¢, Lake, and casting brands at 16¢, the nominal Lake quotation in the open market remaining 17¢ @ 17.40¢ for the present. The remnant of the short interest still to be covered at New York is understood to be trifling, and the entire position of the metal is devoid of interest, except so far as a cable dispatch is concerned, received on Monday morning from Paris, in which it is asserted that the syndicate has exhausted its resources and is to create a "metal bank" to get out of the scrape. The Société des Métaux proposes to assume 40,000 tons of Copper and the "metal bank" 90,000 tons, together with all contracts for the two years to come. The liabilities of M. Bex, the unfortunate speculator in Copper shares, who recently committed suicide, amount to 11,000,000 francs, and his assets do not exceed 4,000,000 francs. The syndicate opened the year with a joint stock of Copper of something like 145,000 tons here and in Europe, and if the experience of last year is to be repeated in 1889 it will hold 245,000 tons at the close of the latter. The 145,000 tons alluded to represent about \$50,000,000 American gold. To financier successfully such amounts and maintain the price in the face of rapidly growing production all over the world is not an easy task, which can hardly be accomplished if anything unforeseen happens and pushes the syndicate and its financial supporters to the wall. The whole

enterprise as it stands rests on a most precarious basis, and consumers will do well to proceed with the utmost caution, and shun all anticipation of requirements if they can.

Tin.—Has been lacking activity since our last report, both in London and here, quite as much as Copper, the sales in London not exceeding 200 tons all told, the price giving way from £98. 15/, spot Straits, to £98. 2/6 this morning, and futures from £99. 10/ to £98. 12/6. Here nothing was sold but 10 tons spot at 21.70¢ and 10 tons March at 21.95¢, which quotations have remained nominally upheld.

Tin Plates.—Our market has been dull on the spot, but fairly active in futures at steady rates. Prior to the late Birmingham meeting, alluded to in our last, a large business was done on the other side in anticipation of it, but the meeting resulted very quietly, without anything of moment being arrived at, and since then trade over there has relapsed into a dull state at 13/ @ 18/8 for Coke. We quote at the close, large lines, per box: Siemens-Martin Steel, Charcoal Finish. \$4.75 @ \$5.50; Coke Finish, \$4.65 @ \$4.70; Ternes, \$4.12 1/2 @ \$4.25; Coke Tins, \$4.22 1/2 @ \$4.30; and Wasters, \$4.12 1/2 @ \$4.15.

Lead.—Some 300 to 400 tons Common Domestic were taken in the open market at 3.85¢, at which figure the market winds up firm, the quotation out West being 3.60¢. London has not budged from £18. 2/6, Soft Spanish, and £13. 5/, English Pig, in the meantime.

Spelter.—Has remained featureless and inactive at 5¢, Common Domestic, ordinary brands, and Silesian nominally 5.90¢, having declined in London from £18. 12/6 to £18. 7/6.

Antimony.—The demand has been moderate at 12 1/4¢ @ 13¢ Cookson and 10 1/4¢ @ 11¢ Hallett, the latter not varying from £45 in London.

New York Metal Exchange.

The following sales are reported:

THURSDAY, January 10.		
32 tons Lead, March.....	3.90¢	
FRIDAY, January 11.		
10 tons Tin, March.....	21.95¢	
0 tons Tin, spot.....	21.70¢	
TUESDAY, January 15		
25,000 lb. Copper, March.....	17.30¢	

Imports.

Imports for 1888.

We present the following figures, showing the imports of a number of leading firms:

	New York.	Boston.	Total.
	Tons.	Tons.	Tons.
Abbott, Jere & Co.:			
Swedish Iron Wire Rods (Rivets).....	7,578	2,145	9,723
Swedish Nail Rods (Iron and Steel).....	704	501	1,205
Swedish Bar Iron (Bars and Bldgs).....	3,230	172	3,402
Swedish Steel Wire Rods (Martin and Bessemer).....	1,290	88	2,378
Swedish Steel Bars (Martin and Bessemer).....	440	440	
Swedish Scrap Iron (Bar Ends).....	50	100	50
Basic Steel Wire Rods.....	5,141	100	5,241
Charcoal Iron Wire Rods.....	10	10	10
Steel Slabs (Basic and Martin).....	274	2	276
Steel Billets (Basic and Martin).....	2,915	2,421	5,336
Steel Bars (Basic and Martin).....	36	434	470
Steel Sheets.....	61	61	61
Steel Scrap (Plate Shearings).....	352	352	352
Spiegeleisen.....	90	90	90
Ferromanganese.....	31	31	31
Pig Iron.....	500	500	500
Totals.....	21,818	6,778	28,596
Firth Steel.....	536		536
American Metal Company, Limited:			
Antimony.....	322		322
Tin.....	2,476,800		2,476,800
Spelter.....	763,953		763,953
Lead.....	44,296		44,296
Bartlett, N. S. & Co.:			
Pig Iron.....	6,400		6,400

Bidwell & French:	Pounds.
Tin.....	590,006
Byrne, Joseph & Son:	Boxes.
Tin and Terne Plates.....	43,041
Central Stamping Company:	Boxes.
Tin Plates.....	38,436
Coddington, T. B. & Co.:	Tons.
Sheet Iron.....	1,514
Tin Plates.....	181,383
Crocker Brothers:	Tons.
Pig Iron.....	16,645
Spiegeleisen.....	8,541
Crooks, Robert & Co.:	Tons.
Steel Rods.....	375
Old Scrap Iron.....	370
Steel.....	30
Steel Sheets.....	1,101
Tin Plates.....	67,642
Tin.....	1,248,980
DeMitt, H. R. & Co.:	Boxes.
Tin Plates.....	19,731
Dickerson, Van Dusen & Co.:	Boxes.
Tin Plates.....	285,809
Gelsenheimer & Co.:	Tons.
Spiegeleisen.....	517
Ferromanganese.....	725
Hendricks Brothers:	Pounds.
Spelter.....	336,041
Lead.....	506,929
Tin.....	472,306
Antimony.....	272
Leng's, John S. Son & Co.:	Tons.
Steel.....	113
Steel Tubes.....	88
Cotton Ties.....	150
Steel Hoops.....	1,912
Lombard, Ayres & Co.:	Boxes.
Tin Plates.....	21,491
Milne, A. & Co.:	Tons.
Pig Iron.....	2,886
Swedish Iron.....	1,060
Steel Blooms, Billets and Bars.....	2,540
Steel Rods.....	1,880
Steel Sheets.....	66
Iron Sheets.....	10
Steel Scrap.....	770
Spiegeleisen.....	20
Morewood, G. B. & Co.:	Boxes.
Tin Plates.....	51,621
Muller, Schall & Co.:	Pounds.
Tin.....	11,718,484
Spelter.....	111,994
Pilditch, F. S.:	Tons.
Steel.....	525
Steel Rods.....	13
Phelps, Dodge & Co.:	Boxes.
Tin Plates.....	572,388
Tin.....	4,196,415
Antimony.....	780
Pope's, Thos. J. Sons & Co.:	Pounds.
Tin.....	806,400
Spelter.....	56,006
Pig Iron.....	404
Pratt Mfg. Company:	Boxes.
Tin Plates.....	175,086
Naylor & Co.:	Tons.
Iron Ore.....	5,242
Steel Rods.....	19,604
Steel Sheets.....	594
Steel Bars.....	439
Steel Blooms.....	3,849
Steel Nail Rods.....	108
Steel Plates.....	273
Iron Rods.....	847
Swedish Bar Ends.....	32
Charcoal Iron.....	774
Steel Plate Cuttings.....	200
Pig Iron.....	7,445
Steel Billets.....	1,947
Steel Wire Rods.....	614
Steel Hoops.....	25
Ferromanganese.....	375
Steel Tires.....	59
Cotton Ties.....	5,312
Steel Crop Ends.....	3,190
Swedish Iron.....	420
Steel.....	583
Swedish Iron Bars.....	100
Rivet Rods.....	371
Scrap Steel.....	178
Steel Rails.....	75
Rolled Iron.....	20
Steel Strips.....	37
Old Spring Steel.....	200
Steel Slabs.....	103
Zinc Sheets.....	25
Tin.....	3,831,690
Spelter.....	778,437
Stetson, G. W., & Co.:	Tons.
Pig Iron.....	15,250
Wolff, R. H., & Co.:	Tons.
Steel Rods.....	7,000
Steel (various assortments).....	1,200
Wolff & Roesing:	Boxes.
Tin Plates.....	43,635

Financial.

The event of the week was the consummation of the railroad presidents' agreement, all interests represented working in harmony, with the single object of maintaining tariffs on a basis of equity conducive to the general prosperity. The sincerity of the action taken was considered beyond a doubt. It was believed, too, that while some modification is probable, the underlying principles are in compli-

Spelter.—The market firm, but demand moderate. Quoted at £18. 5/ @ £18. 10/ for ordinary Silesian.

Hardware.

There are signs of increased activity in Hardware circles, though the volume of business is not yet heavy. The opening of the year has brought less than the usual number of changes in list prices and discounts, goods generally being held without material change.

Wire Nails.

There are evidences of a reaction from the extreme prices which within a few weeks have been made by some of the manufacturers, and in some instances the lowest figures at which sales were made have been withdrawn. Some of the manufacturers are disposed to practically withdraw from the market until the situation becomes more settled and satisfactory. The price at factory for carload lots remains \$2.30, f.o.b. Small lots from store are held at the usual advance.

Cut Nails.

The New York market is quiet and steady, the volume of business being satisfactory for the season. Prices remain at \$1.80 to \$1.90 for carload lots on dock. On Friday, the Eastern Cut Nail makers hold a meeting at Philadelphia, to receive the report of the committee appointed to draw up a plan for an organization. It is understood that this committee has conferred with the managers of the Ohio Valley association, and that the plan proposed will be on the same general lines, involving the deposit of a fixed sum per machine, and allotments of sales, with payment of penalty of 10 cents, according to whether the month's sales do not reach it or exceed it.

The regular monthly meeting of the recently organized Western Cut Nail Manufacturers' Association was held at Wheeling, W. Va. on Wednesday, the 9th inst. Nothing but routine business was transacted. It was decided to make no change in the present card rate of \$1.90, less 10 cents per keg in carload lots, 2 per cent. off for cash. It is stated that there has been a decided improvement both in price and demand since the organization was formed, and that the card rate is being steadily adhered to by the members.

The Calumet Iron and Steel Company, of Chicago, have adopted the policy of improving the character of their Steel Nails in every way possible, believing that in the present condition of the Nail trade preference will be given to the best goods to be had at an even price. Their common Cut Nail is described as very symmetrical and of exact proportions, special attention being given to points, which are often passed over with slight consideration. The Parallel Chisel-Pointed Nail, which they put on the market a short time since, is said to be meeting with increasing favor, and they regard it as bidding fair to become a strong competitor with the Wire Nail.

Barb Wire.

The Eastern market is characterized by continued inactivity, business being limited almost entirely to small lots for immediate requirements. Quotations are thus, to a large extent, nominal, but are referred to as well maintained, being held as follows, with deliveries: Four Point Galvanized, in car lots, 3.6 cents; 3-ton lots, 3.7 cents; smaller parcels, 3.9 cents.

Miscellaneous Prices.

There is more or less irregularity in the prices at which the jobbing trade are selling the Winchester Arms, the restrictions heretofore imposed by the company having been withdrawn, leaving the wholesale dealers free to sell at any prices they

choose. Even with the contract system heretofore in force there was more or less cutting of prices, as is to be expected with leading goods so widely and favorably known. A further irregularity has been induced by the quotation of the E. C. Meacham Arms Company, St. Louis, Mo., who are offering the Winchester Arms, in case lots, at discount 25 and 10 and 10 per cent. from the manufacturers' list, terms spot cash, orders of less than a case being given a discount of 25 and 10 per cent.

In connection with the new list of Putnam Nails, which has been adopted by the Putnam Nail Company, Neponset, Boston, Mass., and which was printed in our issue, January 8, we would call attention to the fact that their discount of 15 per cent. applies to purchases of 1000 pounds during the year. The following letter from the Company explains more fully the system of discounts which they have adopted, and gives information of interest in regard to this method of marketing the goods:

Since the issue of our new list and discounts based on quantity our mail has been loaded with inquiries as to its practical working. Knowing that through your valuable paper we can reach most of those who handle our goods in this country, we take the liberty to ask you to publish this for the general information of the trade. In the past, when the trade in our goods was more limited, our former method of quoting special discounts to each customer was more practical, but with the extension of the business, especially since opening our Chicago branch, there has been much friction caused by the cutting of prices, so that it has been said there is little profit in handling Putnam Nails.

Now, although none expect to make so large a margin on staple goods as on others, yet the high reputation and well-known character of such articles make the sales easy in large quantities, as they require no introduction and no special effort to effect sales. From our list, which was published in your issue of January 8, we make the first discount of 15 per cent. to purchasers of 1000 pounds, and settle accordingly. Should, however, this same customer increase his purchases to 3000 and afterward to 5000 pounds and over he will be entitled to settle on the whole purchase of the year at 15 per cent. and the discounts allowed for such a quantity. If a party books an order in good faith for 5000 pounds and over for the year we shall extend to him the same line of discounts. We shall, however, discourage syndicates, or combinations of parties for the purpose of securing discounts to which they are not entitled.

This puts the whole trade on an even basis, and, if all will live up to it, will enable the small trade to furnish the goods at a reasonable price to the smiths, and at the same time insure a fair profit to those who handle the goods in large quantities. We now look to the trade for a cordial support in sustaining these quantity discounts, and we shall absolutely refuse to furnish our goods to any person, firm or company who intentionally cuts these rates. We have furnished a box price to the shoers based on \$4.75 for No. 8's. We shall not undertake to fix the price to the smiths, but leave that to the discretion of the small trade. We leave the supply of the shoers to the local trade, as it is utterly impracticable for us to furnish the goods in small lots. We allow freight on direct shipments in lots of ten boxes and over to place of destination at railroad points.

Simonton & Co., Kidd Steel Wire Company, Pittsburgh, Pa., are quoting a discount of 30 and 2½ per cent. on their Drill Rods. These Rods are described as made from specially imported crucible cast steel, and their quality is emphasized.

The Auburn Mfg. Company, Auburn, N. Y., advise us of an advance on their Scythes above the discounts named in our last issue, making their present prices as follows:

Grain Scythes.....dis 40 %
Grass and Bush Scythes...dis 40&5 @ 40&10 %

Cooper & McKee, 119 Gwinnett street, Brooklyn, N. Y., have issued their catalogue for 1889 in the form of a conveniently arranged and attractively printed pamphlet with an elegantly engraved cover. It represents an attractive line of Refrigerators, of which a variety of patterns are shown, Meat Safes, Blacking Cases, and a number of specialties in

Wooden-Ware. It is accompanied by the following discount sheet, which refers more in detail to the contents of the price list, and gives discounts, there being an extra 2 per cent. discount for cash in 10 days:

	Discount.
Domestic, pages 3 to 6, 16 and 17.....	45 %
Columbia, pages 9 to 11 and 18.....	45 %
Household, pages 12 and 13.....	45 %
Houses and Flats, pages 14 and 15.....	50 %
Grocer Chests, pages 19 and 20.....	50 %
Star Grocer, page 21.....	\$100 net
Lager Beer Boxes, pages 22 to 26.....	50 %
Water Coolers, page 27.....	50 %
Refrigerator Fans, page 27.....	50 %
Meat Safes, pages 28 and 29.....	50 %
Blacking Cases, pages 30 and 31.....	50 %
Commodore, page 32.....	50 %
Wooden-Ware, pages 33 to 38.....	50 %
Water Tanks, page 7.....	Net
Beer Drips, page 27.....	Net

The following are revised discounts of the Phoenix Wire Works, Detroit, Mich. Terms 30 days, 2 per cent. discount for cash in 10 days.

	Discount.
Counter Railing.....	45 %
Cresting.....	45 %
Finials.....	50 %
Tower Ornament.....	33½ %
Weather Vanes:	
Horses, Roosters and Eagles.....	40 %
Arrow and Scroll Vanes.....	33½ %
Stable Fixtures.....	50 %
Hitching Posts.....	55 %
Stall Partitions.....	50 %
Iron Bedsteads.....	30 %
Iron Wire Cloth, full rods.....	70 %
" " " cut pieces.....	60 %
Plastering Wire Cloth.....	50 %
Galvanized " ".....	60 %
Twilled " ".....	50 %
Flower-Pot Stands.....	50 %
No. 40 Fenders and No. 5 Stove Guards.....	33½ %
Tinned wire Spark Guards.....	50 %
Special price by the dozen.	
Crimped Brass Wire Spark Guards, double the price of tinned.	
No. 45 Brass Spark Guards, laced.....	40 %
Wire and Iron Mail Boxes.....	50 %
Ox Muzzles.....	50 %
Spoiled Hair Wire.....	50 %
By the gross.....	60&10 %
Coal Screens.....	40 %
Sand Screens.....	50 %
Galvanized Twist Wire Netting, full rolls.....	70&10 %
Galvanized Twist Wire Netting, less than full roll.....	60 %
Twist Wire Fencing, galvanized.....	25 %
" " " painted.....	33½ %
Foundry Riddles.....	45 %
Casting Brushes.....	55 %
Ash Sifters.....	50 %
Oat Sieves and Farmers' Riddles.....	50 %
Ferret Traps.....	50 %
Counter Supports.....	33½ %
Ash Pit Doors and Ventilating Grates.....	50 %

They also announce the following prices on the goods named: Terms f.o.b. Detroit 30 days, 2 per cent. discount for cash in ten days:

	Per dozen.
Heavy Molders' Riddles, 18 inch inside diameter. Steel.....	\$3.90
Galvanized.....	4.75
Brass.....	7.00
Steel Wire Casting Brushes: 5 Row—	
8 inch wire.....	3.10
5 Row—4 inch wire.....	3.45
" 5 ".....	3.75
4 Row—3 ".....	2.65
" 4 ".....	3.00
" 5 ".....	3.35
Round Brushes: 5 inch wire.....	3.25
6 inch wire.....	3.50
Hard Foundry Brushes: Without Handles	1.35
With Handles.....	1.60
Soft Foundry Brushes.....	4.50
Molders' Bellows, 10 inch.....	11.00
Steel Shovels.....	8.50
Steel Wire Brooms.....	5.75

Bemis & Call Hardware and Tool Company, Springfield, Mass., have made a reduction on their No. 3 Pipe Wrench, the discount on which is now 40 and 10 per cent., instead of 35 and 5 per cent., as heretofore. Having improved facilities for the making of these particular Wrenches, by which they are enabled to produce them at a reduced cost, they have decided to give the trade the benefit, as above noted.

The market for Rope is firm, but no further advance has at this writing been

made. One reason for the strength of the market is the small supply of both Manila and Sisal Hemp, which is accounted for largely by the unwillingness of importers to import more than is required for actual necessities, on account of the uncertainty attending tariff legislation, there being some likelihood of a reduction in the duty. The stock held abroad is understood to be ample.

The course of the market during the past few weeks has witnessed slight concessions on Strap and T-Hinges and Wrought Butts. Quotations at which these goods are offered by different manufacturers vary somewhat, but ruling prices are acknowledged to be unsatisfactorily low.

As we go to press a report reaches us that a number of the manufacturers of Enamelled Hollow-Ware have formed a combination and agreed upon advanced prices. We are not advised in regard to the details.

Gay & Parsons, Augusta, Me., issue a new edition of their circular and list relating to their Double Action Screw-Drivers. They explain its mechanism, allude to its advantages, give list prices and name the discount of 35 per cent., cash in 30 days.

The Palermo Mica Company, 27 Peck slip, New York, publish the following reduced price list of Mica for 1889, the new list taking effect from January 1:

Size.	Price per lb.	Size.	Price per lb.	Size.	Price per lb.
1 1/2 x 2	\$0.40	2 1/2 x 3 1/2	.90	3 1/2 x 5 1/2	7.00
1 1/2 x 2 1/2	.40	2 1/2 x 3 1/2	1.00	3 1/2 x 6	7.50
1 1/2 x 3	.40	2 1/2 x 4	1.20	3 1/2 x 6 1/2	7.50
1 1/2 x 3 1/2	.40	2 1/2 x 4 1/2	1.55	3 1/2 x 7	7.75
1 1/2 x 4	.45	2 1/2 x 5	2.00	3 1/2 x 8	7.75
1 1/2 x 4 1/2	.50	2 1/2 x 5 1/2	2.45	3 1/2 x 9	8.00
1 1/2 x 5	.55	2 1/2 x 6	3.25	3 1/2 x 9 1/2	8.00
1 1/2 x 5 1/2	.65	2 1/2 x 6 1/2	3.40	3 1/2 x 10	8.00
1 1/2 x 6	.75	2 1/2 x 7	3.40	3 1/2 x 10 1/2	8.20
1 1/2 x 6 1/2	.80	2 1/2 x 7 1/2	3.60	3 1/2 x 11	8.00
1 1/2 x 7	.80	2 1/2 x 8	3.75	3 1/2 x 11 1/2	8.25
1 1/2 x 7 1/2	.80	2 1/2 x 8 1/2	3.75	3 1/2 x 12	8.50
1 1/2 x 8	.80	2 1/2 x 9	3.75	3 1/2 x 12 1/2	8.50
1 1/2 x 8 1/2	.80	2 1/2 x 9 1/2	3.75	3 1/2 x 13	8.50
1 1/2 x 9	.80	2 1/2 x 10	3.75	3 1/2 x 13 1/2	8.50
1 1/2 x 9 1/2	.80	2 1/2 x 10 1/2	3.75	3 1/2 x 14	8.50
1 1/2 x 10	.80	2 1/2 x 11	3.75	3 1/2 x 14 1/2	8.50
1 1/2 x 10 1/2	.80	2 1/2 x 11 1/2	3.75	3 1/2 x 15	8.50
1 1/2 x 11	.80	2 1/2 x 12	3.75	3 1/2 x 15 1/2	8.50
1 1/2 x 11 1/2	.80	2 1/2 x 12 1/2	3.75	3 1/2 x 16	8.50
1 1/2 x 12	.80	2 1/2 x 13	3.75	3 1/2 x 16 1/2	8.50
1 1/2 x 12 1/2	.80	2 1/2 x 13 1/2	3.75	3 1/2 x 17	8.50
1 1/2 x 13	.80	2 1/2 x 14	3.75	3 1/2 x 17 1/2	8.50
1 1/2 x 13 1/2	.80	2 1/2 x 14 1/2	3.75	3 1/2 x 18	8.50
1 1/2 x 14	.80	2 1/2 x 15	3.75	3 1/2 x 18 1/2	8.50
1 1/2 x 14 1/2	.80	2 1/2 x 15 1/2	3.75	3 1/2 x 19	8.50
1 1/2 x 15	.80	2 1/2 x 16	3.75	3 1/2 x 19 1/2	8.50
1 1/2 x 15 1/2	.80	2 1/2 x 16 1/2	3.75	3 1/2 x 20	8.50
1 1/2 x 16	.80	2 1/2 x 17	3.75	3 1/2 x 20 1/2	8.50
1 1/2 x 16 1/2	.80	2 1/2 x 17 1/2	3.75	3 1/2 x 21	8.50
1 1/2 x 17	.80	2 1/2 x 18	3.75	3 1/2 x 21 1/2	8.50
1 1/2 x 17 1/2	.80	2 1/2 x 18 1/2	3.75	3 1/2 x 22	8.50
1 1/2 x 18	.80	2 1/2 x 19	3.75	3 1/2 x 22 1/2	8.50
1 1/2 x 18 1/2	.80	2 1/2 x 19 1/2	3.75	3 1/2 x 23	8.50
1 1/2 x 19	.80	2 1/2 x 20	3.75	3 1/2 x 23 1/2	8.50
1 1/2 x 19 1/2	.80	2 1/2 x 20 1/2	3.75	3 1/2 x 24	8.50
1 1/2 x 20	.80	2 1/2 x 21	3.75	3 1/2 x 24 1/2	8.50
1 1/2 x 20 1/2	.80	2 1/2 x 21 1/2	3.75	3 1/2 x 25	8.50
1 1/2 x 21	.80	2 1/2 x 22	3.75	3 1/2 x 25 1/2	8.50
1 1/2 x 21 1/2	.80	2 1/2 x 22 1/2	3.75	3 1/2 x 26	8.50
1 1/2 x 22	.80	2 1/2 x 23	3.75	3 1/2 x 26 1/2	8.50
1 1/2 x 22 1/2	.80	2 1/2 x 23 1/2	3.75	3 1/2 x 27	8.50
1 1/2 x 23	.80	2 1/2 x 24	3.75	3 1/2 x 27 1/2	8.50
1 1/2 x 23 1/2	.80	2 1/2 x 24 1/2	3.75	3 1/2 x 28	8.50
1 1/2 x 24	.80	2 1/2 x 25	3.75	3 1/2 x 28 1/2	8.50
1 1/2 x 24 1/2	.80	2 1/2 x 25 1/2	3.75	3 1/2 x 29	8.50
1 1/2 x 25	.80	2 1/2 x 26	3.75	3 1/2 x 29 1/2	8.50
1 1/2 x 25 1/2	.80	2 1/2 x 26 1/2	3.75	3 1/2 x 30	8.50
1 1/2 x 26	.80	2 1/2 x 27	3.75	3 1/2 x 30 1/2	8.50
1 1/2 x 26 1/2	.80	2 1/2 x 27 1/2	3.75	3 1/2 x 31	8.50
1 1/2 x 27	.80	2 1/2 x 28	3.75	3 1/2 x 31 1/2	8.50
1 1/2 x 27 1/2	.80	2 1/2 x 28 1/2	3.75	3 1/2 x 32	8.50
1 1/2 x 28	.80	2 1/2 x 29	3.75	3 1/2 x 32 1/2	8.50
1 1/2 x 28 1/2	.80	2 1/2 x 29 1/2	3.75	3 1/2 x 33	8.50
1 1/2 x 29	.80	2 1/2 x 30	3.75	3 1/2 x 33 1/2	8.50
1 1/2 x 29 1/2	.80	2 1/2 x 30 1/2	3.75	3 1/2 x 34	8.50
1 1/2 x 30	.80	2 1/2 x 31	3.75	3 1/2 x 34 1/2	8.50
1 1/2 x 30 1/2	.80	2 1/2 x 31 1/2	3.75	3 1/2 x 35	8.50
1 1/2 x 31	.80	2 1/2 x 32	3.75	3 1/2 x 35 1/2	8.50
1 1/2 x 31 1/2	.80	2 1/2 x 32 1/2	3.75	3 1/2 x 36	8.50
1 1/2 x 32	.80	2 1/2 x 33	3.75	3 1/2 x 36 1/2	8.50
1 1/2 x 32 1/2	.80	2 1/2 x 33 1/2	3.75	3 1/2 x 37	8.50
1 1/2 x 33	.80	2 1/2 x 34	3.75	3 1/2 x 37 1/2	8.50
1 1/2 x 33 1/2	.80	2 1/2 x 34 1/2	3.75	3 1/2 x 38	8.50
1 1/2 x 34	.80	2 1/2 x 35	3.75	3 1/2 x 38 1/2	8.50
1 1/2 x 34 1/2	.80	2 1/2 x 35 1/2	3.75	3 1/2 x 39	8.50
1 1/2 x 35	.80	2 1/2 x 36	3.75	3 1/2 x 39 1/2	8.50
1 1/2 x 35 1/2	.80	2 1/2 x 36 1/2	3.75	3 1/2 x 40	8.50
1 1/2 x 36	.80	2 1/2 x 37	3.75	3 1/2 x 40 1/2	8.50
1 1/2 x 36 1/2	.80	2 1/2 x 37 1/2	3.75	3 1/2 x 41	8.50
1 1/2 x 37	.80	2 1/2 x 38	3.75	3 1/2 x 41 1/2	8.50
1 1/2 x 37 1/2	.80	2 1/2 x 38 1/2	3.75	3 1/2 x 42	8.50
1 1/2 x 38	.80	2 1/2 x 39	3.75	3 1/2 x 42 1/2	8.50
1 1/2 x 38 1/2	.80	2 1/2 x 39 1/2	3.75	3 1/2 x 43	8.50
1 1/2 x 39	.80	2 1/2 x 40	3.75	3 1/2 x 43 1/2	8.50
1 1/2 x 39 1/2	.80	2 1/2 x 40 1/2	3.75	3 1/2 x 44	8.50
1 1/2 x 40	.80	2 1/2 x 41	3.75	3 1/2 x 44 1/2	8.50
1 1/2 x 40 1/2	.80	2 1/2 x 41 1/2	3.75	3 1/2 x 45	8.50
1 1/2 x 41	.80	2 1/2 x 42	3.75	3 1/2 x 45 1/2	8.50
1 1/2 x 41 1/2	.80	2 1/2 x 42 1/2	3.75	3 1/2 x 46	8.50
1 1/2 x 42	.80	2 1/2 x 43	3.75	3 1/2 x 46 1/2	8.50
1 1/2 x 42 1/2	.80	2 1/2 x 43 1/2	3.75	3 1/2 x 47	8.50
1 1/2 x 43	.80	2 1/2 x 44	3.75	3 1/2 x 47 1/2	8.50
1 1/2 x 43 1/2	.80	2 1/2 x 44 1/2	3.75	3 1/2 x 48	8.50
1 1/2 x 44	.80	2 1/2 x 45	3.75	3 1/2 x 48 1/2	8.50
1 1/2 x 44 1/2	.80	2 1/2 x 45 1/2	3.75	3 1/2 x 49	8.50
1 1/2 x 45	.80	2 1/2 x 46	3.75	3 1/2 x 49 1/2	8.50
1 1/2 x 45 1/2	.80	2 1/2 x 46 1/2	3.75	3 1/2 x 50	8.50
1 1/2 x 46	.80	2 1/2 x 47	3.75	3 1/2 x 50 1/2	8.50
1 1/2 x 46 1/2	.80	2 1/2 x 47 1/2	3.75	3 1/2 x 51	8.50
1 1/2 x 47	.80	2 1/2 x 48	3.75	3 1/2 x 51 1/2	8.50
1 1/2 x 47 1/2	.80	2 1/2 x 48 1/2	3.75	3 1/2 x 52	8.50
1 1/2 x 48	.80	2 1/2 x 49	3.75	3 1/2 x 52 1/2	8.50
1 1/2 x 48 1/2	.80	2 1/2 x 49 1/2	3.75	3 1/2 x 53	8.50
1 1/2 x 49	.80	2 1/2 x 50	3.75	3 1/2 x 53 1/2	8.50
1 1/2 x 49 1/2	.80	2 1/2 x 50 1/2	3.75	3 1/2 x 54	8.50
1 1/2 x 50	.80	2 1/2 x 51	3.75	3 1/2 x 54 1/2	8.50
1 1/2 x 50 1/2	.80	2 1/2 x 51 1/2	3.75	3 1/2 x 55	8.50
1 1/2 x 51	.80	2 1/2 x 52	3.75	3 1/2 x 55 1/2	8.50
1 1/2 x 51 1/2	.80	2 1/2 x 52 1/2	3.75	3 1/2 x 56	8.50
1 1/2 x 52	.80	2 1/2 x 53	3.75	3 1/2 x 56 1/2	8.50
1 1/2 x 52 1/2	.80	2 1/2 x 53 1/2	3.75	3 1/2 x 57	8.50
1 1/2 x 53	.80	2 1/2 x 54	3.75	3 1/2 x 57 1/2	8.50
1 1/2 x 53 1/2	.80	2 1/2 x 54 1/2	3.75	3 1/2 x 58	8.50
1 1/2 x 54	.80	2 1/2 x 55	3.75	3 1/2 x 58 1/2	8.50
1 1/2 x 54 1/2	.80	2 1/2 x 55 1/2	3.75	3 1/2 x 59	8.50
1 1/2 x 55	.80	2 1/2 x 56	3.75	3 1/2 x 59 1/2	8.50
1 1/2 x 55 1/2	.80	2 1/2 x 56 1/2	3.75	3 1/2 x 60	8.50
1 1/2 x 56	.80	2 1/2 x 57	3.75	3 1/2 x 60 1/2	8.50
1 1/2 x 56 1/2	.80	2 1/2 x 57 1/2	3.75	3 1/2 x 61	8.50
1 1/2 x 57	.80	2 1/2 x 58	3.75	3 1/2 x 61 1/2	8.50
1 1/2 x 57 1/2	.80	2 1/2 x 58 1/2	3.75	3 1/2 x 62	8.50
1 1/2 x 58	.80	2 1/2 x 59	3.75	3 1/2 x 62 1/2	8.50
1 1/2 x 58 1/2	.80	2 1/2 x 59 1/2	3.75	3 1/2 x 63	8.50
1 1/2 x 59	.80	2 1/2 x 60	3.75	3 1/2 x 63 1/2	8.50
1 1/2 x 59 1/2	.80	2 1/2 x 60 1/2	3.75	3 1/2 x 64	8.50
1 1/2 x 60	.80	2 1/2 x 61	3.75	3 1/2 x 64 1/2	8.50
1 1/2 x 60 1/2	.80	2 1/2 x 61 1/2	3.75	3 1/2 x 65	8.50
1 1/2 x 61	.80	2 1/2 x 62	3.75	3 1/2 x 65 1/2	8.50
1 1/2 x 61 1/2	.80	2 1/2 x 62 1/2	3.75	3 1/2 x 66	8.50
1 1/2 x 62	.80	2 1/2 x 63	3.75	3 1/2 x 66 1/2	8.50
1 1/2 x 62 1/2	.80	2 1/2 x 63 1/2	3.75	3 1/2 x 67	8.50
1 1/2 x 63	.80	2 1/2 x 64	3.75	3 1/2 x 67 1/2	8.50
1 1/2 x 63 1/2	.80	2 1/2 x 64 1/2	3.75	3 1/2 x 68	8.50
1 1/2 x 64	.80	2 1/2 x 65	3.75	3 1/2 x 68 1/2	8.50
1 1/2 x 64 1/2	.80	2 1/2 x 65 1/2	3.75	3 1/2 x 69	8.50
1 1/2 x 65	.80	2 1/2 x 66	3.75	3 1/2 x 69 1/2	8.50
1 1/2 x 65 1/2	.80	2 1/2 x 66 1/2	3.75	3 1/2 x 70	8.50
1 1/2 x 66	.80	2 1/2 x 67	3.75	3 1/2 x 70 1/2	8.50
1 1/2 x 66 1/2	.80	2 1/2 x 67 1/2	3.75	3 1/2 x 71	8.50
1 1/2 x 67	.80	2 1/2 x 68	3.75	3 1/2 x 71 1/2	8.50
1 1/2 x 67 1/2	.80	2 1/2 x 68 1/2	3.75	3 1/2 x 72	8.50
1 1/2 x 68	.80	2 1/2 x 69	3.75	3 1/2 x 72 1/2	8.50
1 1/2 x 68 1/2	.80	2 1/2 x 69 1/2	3.75	3 1/2 x 73	8.50
1 1/2 x 69	.80	2 1/2 x 70	3.75	3 1/2 x 73 1/2	8.50
1 1/2 x 69 1/2	.80	2 1/2 x 70 1/2	3.75	3 1/2 x 74	8.50
1 1/2 x 70	.80	2 1/2 x 71	3.75	3 1/2 x 74 1/2	8.50
1 1/2 x 70 1/2	.80	2 1/2 x 71 1/2	3.75	3 1/2 x 75	8.50
1 1/2 x 71	.80	2 1/2 x 72	3.75	3 1/2 x 75 1/2	8.50
1 1/2 x 71 1/2	.80	2 1/2 x 72 1/2	3.75	3 1/2 x 76	8.50
1 1/2 x 72	.80	2 1/2 x 73	3.75	3 1/2 x 76 1/2	8.50
1 1/2 x 72 1/2	.80	2 1/2 x 73 1/2	3.75	3 1/2 x 77	8.50
1 1/2 x 73	.80	2 1/2 x 74	3.75	3 1/2 x 77 1/2	8.50
1 1/2 x 73 1/2	.80	2 1/2 x 74 1/2	3.75	3 1/2 x 78	8.50
1 1/2 x 74	.80	2 1/2 x 75	3.75	3 1/2 x 78 1/2	8.50
1 1/2 x 74 1/2	.80	2 1/2 x 75 1/2	3.75	3 1/2 x 79	8.50
1 1/2 x 75	.80	2 1/2 x 76	3.75	3 1/2 x 79 1/2	8.50
1 1/2 x 75 1/2	.80	2 1/2 x 76 1/2	3.75	3 1/2 x 80	8.50
1 1/2 x 76	.80	2 1/2 x 77	3.75	3 1/2 x 80 1/2	8.50
1 1/2 x 76 1/2	.80	2 1/2 x 77 1/2	3.75	3 1/2 x 81	8.50
1 1/2 x 77	.80	2 1/2 x 78	3.75	3 1/2 x 81 1/2	8.50
1 1/2 x 77 1/2	.80	2 1/2 x 78 1/2	3.75	3 1/2 x 82	8.50
1 1/2 x 78	.80	2 1/2 x 79	3.75	3 1/2 x 82 1/2	8.50
1 1/2 x 78 1/2	.80	2 1/2 x 79 1/2	3.75	3 1/2 x 83	8.50
1 1/2 x 79	.80	2 1/2 x 80	3.75	3 1/2 x 83 1/2	8.50
1 1/2 x 79 1/2	.80	2 1/2 x 80 1/2	3.75	3 1/2 x 84	8.50
1 1/2 x 80	.80	2 1/2 x 81	3.75	3 1/2 x 84 1/2	8.50
1 1/2 x 80 1/2	.80	2 1/2 x 81 1/2	3.75	3 1/2 x 85	8.50
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tendency for the retailers to buy from the manufacturer, having been educated by trade journals like *The Iron Age* in that direction, but our experience teaches us that they soon get sick of it. Of course a retailer who has trade enough to buy in quantities will buy from the manufacturer largely, but he must have an outlet for a large amount of goods to enable him to do so with satisfaction. Manufacturers generally don't want small orders, and are generally unable to fill them promptly, whereas in selling the jobber they get orders for round lots, which furnishes an incentive to put on machines and get the goods out. In our opinion, the jobber is indispensable, and always will be the distributor of manufacturers' products. Education by trade journals, pools, trusts, combinations, &c., have all tended to injure the jobbers, and are doing so now, but we are strongly of the opinion that jobbers are here to stay, and that the retailers must have them, if they do come high.

Regarding the apparent tendency toward direct dealings between the manufacturer and the consumers, a well-known Ohio company write as follows:

With reference to the question as to increase of trade direct from retailers, we beg to say that our observation is that there is a tendency in that direction on part of both retailer and consumer, which we discourage in case of the former by fixed prices f.o.b. here, which enables jobbers in selling at the same prices to save customers' freight from this city. We aim to deal wholly with the trade, and protect their interests carefully against ravages from the consumer, and consider it a matter of business as well as justice to do so.

A jobbing house in Illinois gives the following report in regard to the same matter, alluding especially to the probability that small retailers purchasing directly from the manufacturers will be induced to order more goods than they require:

The larger retailers among our trade buy of the manufacturers whenever they can, and often will buy for a better price than they do of us, always buying in better quantities. The smaller retailers only buy direct occasionally, and invariably buy more goods than they want or need, which teaches them a lesson which lasts a short time. We find that dullness in trade makes us come in competition with the manufacturers oftener than when trade is good, the increased demand probably keeping the manufacturer at home. We manage to hold our own, however, notwithstanding all these drawbacks, and do not believe the retailers can afford to buy of the manufacturers, as a rule.

From a long-established and widely known Western house occupying the position of manufacturers and merchants we have the following advices on the subject:

We believe there is a growing tendency with the manufacturers and retailers to buy from the factory direct. This is largely owing, no doubt, to the fact that small manufacturers have been driven out and the large corporations are taking the trade. This has been in certain lines of goods only. As far as our trade is concerned, it has shown an increase each year, and we believe the jobber is requisite to the trade, and think that manufacturers generally are disposed to recognize the jobber as the legitimate distributor of their goods. We know that the active brokers are on the alert and are endeavoring to show the manufacturers that their interests lie with them. We will not discuss the matter, however. It has always been our aim in business to maintain the most pleasant business relations between manufacturers and ourselves, believing our interests are identical and in the motto "live and let live," and we have only found one or two manufacturers in the many years we have been in business who have acted contrary to this spirit.

An Ohio concern manufacturing a line of Power Tools advise us that it has been their aim, so far as possible, to have good reliable dealers in each of the larger cities handle their Tools, and they give to them the exclusive agency for the same and protect them in every way possible. They state that this has been found more advantageous in many respects than to endeavor to sell direct to the users of Tools.

Referring to their methods of marketing the goods a well-known Eastern manufacturer of a special line writes:

We find St. Louis an excellent point for the sale of our goods, as more business is probably done there through agencies for the different manufacturers than through the branch stores of the manufacturers themselves. We find that we can handle the consumers' trade from Boston to Chicago direct at a better advantage than we can through agencies, but west of Chicago, as well as through the South, more especially the Mississippi Valley, we find it to our advantage to have our goods sold through agencies appointed by ourselves.

A large manufacturing concern of Pittsburgh, Pa., refers to there being an increasing tendency, not only on the part of merchants, but also on the part of consumers, to buy direct of the manufacturer, but as manufacturers, our correspondents advise us, they make a quantity price on some of their lines, preferring to sell in large quantities and lower prices to responsible merchants, who have more regard for their business obligations than many of the small dealers.

A prominent Hardware house in Ohio refers to the fact that each year since their establishment they have increased their business over the preceding year, the year just past being no exception, and allude to this as evidence that in the present tendency they, as jobbers, find nothing to cause apprehension.

St. Louis.

B. G. Farrar & Co., brokers and manufacturers' agents, have removed from 624 Chestnut street to 620 and 622 N. Main street, St. Louis, Mo. Prominent among the manufacturers they represent are the following:

Indianapolis Bolt and Machine Works, Indianapolis, Ind.—Machine Bolts, Lag Screws, &c.
 Maris Machine Co., Philadelphia, Pa.—Portable Hoists.
 Jayne & Crosby, New York.—Patent Coat and Hat Hooks.
 Stover Mfg. Company, Freeport, Ill.—Screen Doors and Sash Pulleys.
 Hammer & Co., Branford, Conn.—Iron Oilers and Lamps.
 A. E. Currier, Chesterfield Factory, N. H.—Auger Bits and Lake's Gimlet Bits.
 Seneca Falls Lawn Mower Company, Seneca Falls, N. Y.—Lawn Mowers.
 Gibbs' Lawn Rake Company, Canton, Ohio.—Gibbs' Lawn Rakes, Post-Hole Diggers and Dutchy Hoes.
 Thompson Mfg. Company, Lansingburg, N. Y.—Sunshine Shoe Sets and Daubers.
 Paragon Novelty Company, New Haven, Conn.—Paragon Wrenches, Brass Knucks, Speed Indicators, &c.
 E. D. Ransom & Co., Albany, N. Y.—Foundry Facings and Foundry Supplies.
 Cleveland Twist Drill Company, Cleveland, Ohio.—Twist Drills, Reamers, &c.
 F. F. Adams Company, Erie, Pa.—Wringers, Step Ladders, Mouse and Rat Traps, &c.
 Vitrifed Emery Wheel Company, Westfield, Mass.—Emery-Wheels and Emery-Wheel Machinery.
 Niagara Stamping and Tool Company, Buffalo, N. Y.—Tanners' Tools and Machines.
 Sequatchee Hoe and Tool Company, South Pittsburg, Tenn.—Planters' Hoes.
 Sharon Steel Casting Company, Sharon, Pa.—Open-Hearth Steel Castings of every description.
 Romer & Co., Newark, N. J.—Padlocks, Jail Locks, Railroad Car Locks and Queen Anne Patent Door Locks.
 Cummings & Hosack, Fredericktown, Ohio.—Farm and Church Bells.
 Birmingham Lock Works, Birmingham, Ala.—Locks, Nails and Brads.
 O. Lindemann & Co., New York.—Bird Cages, Tea Trays and Cutlery.

Items.

Bates, Wilson & Co. announce to the trade that they will hereafter conduct their business under the name and style of their factory, the Snell Mfg. Company. The office and warerooms will be continued at 80 Chambers street, New York, the same as heretofore. Duncan K. Major, well and favorably known to the trade, will be their sole representative on the road. They expressly hope that they will be favored with a continuance of the patronage which has been accorded them from many of the leading firms of the United States and foreign countries. It is a pleasure to note that this company is about entering upon the completion of its first century, having been established in 1790, and has been in existence continuously since that date. The fact that they have within a few years added to their Auger and Bit and Boring Machine works at Fiskdale, Mass., a large factory, devoted to the manufacture of Ship Augers and Ship Bits of all kinds, which have become well and favorably known to the trade, indicates the growth and enterprise of the company.

The Portchester Bolt and Nut Company, Portchester, N. Y., have issued a new price list January 1, 1889. Besides representing their former line of goods, it shows a much larger line of Cold Punched Nuts for car builders, locomotive works and machinists, this branch of their business having more than doubled during the past year. They report an excellent trade in all their lines, and regard the outlook for the future as gratifying. The price list is a pamphlet of 25 pages, well and clearly printed.

Gwinner, Dowrey & Co., Hamilton, Ohio, advise us that the Reading Hardware Company are no longer handling their Casters exclusively, but they are making arrangements with parties in different parts of the country to represent them. Among these are F. L. Honore, Chicago, for the Northwest; W. H. Quinn & Co., 99 Chambers street, New York, for the East, and W. J. Flynn, Toronto, Ont., in Canada. They also issue a circular relating to their Casters, in which they allude to a small Store Truck, 16 x 20, which is furnished with a No. 7 Caster and listed at \$1.50. It is referred to as very convenient for stores that have boxes to handle.

E. E. Prussia & Co., Fort Dodge, Iowa, issue a colored lithographic calendar, in which they call attention to their line of Hardware, Stoves, Blacksmiths' Supplies, &c.

I. B. Williams & Sons, Dover, N. H., have opened a store, under the management of Daniel J. McVay, at No. 16 Dey street, New York, where they will carry a full stock of Oak Tanned Leather Belting and Rawhide Tanned Laced Leather of their manufacture.

John Sommer's Son, Newark, N. J., is issuing some excellent Blotters with printed matter, which calls attention to his extensive line of Faucets. They are sent out with circulars in German and English.

Announcement is made that the partnership lately subsisting between John C. Schmidt and Chas. D. Nes, York, Pa., under the firm name of John C. Schmidt & Co., was dissolved January 1 by mutual cons. nt. The business of the partnership will be settled up by John C. Schmidt, who will continue the manufacture of Chains as heretofore, under the name of John C. Schmidt & Co. Announcement is also made by Chas. I. Nes that he, with the superintendent of the old firm, will commence at once to erect a new plant, which will be known as the Nes Chain

Mfg. Company, for the manufacture of Chain. They expect to be in operation, with improved facilities, by the middle or latter part of March.

Under date January 1, 1889, the Gilbert & Bennett Mfg. Company, New York and Chicago, issue a revised price list of Galvanized Steel Wire Netting. Illustrations and list prices are given.

C. C. Taylor, Pontiac, Mich., has a convenient calendar, brilliantly mounted, in which he calls attention to the Pontiac Platform Wagon, Carriages, Cutters, &c., of his manufacture.

The Nubian Iron Enamel Company, Chicago, Ill., issue a price list in convenient form relating to their Bonnell's Quick Drying Nubian Iron Enamel, Quick Drying Boiler Black, Paraffine Boiler Black, Stove Polish, &c. They also illustrate the attractive lacquered can with a colored label in which their Nubian Iron Enamel is put up for household use. They also put their best grade of Quick Drying in small cans for home use.

The Hollow Cable Mfg. Company, Hornellsville, N. Y. issue a circular relating to their Preston's Braided Barbless Fence Wire, illustrating its special features and enumerating its advantages, with explanation of the manner in which it is used, and extracts from parties familiar with it. Information is thus given in regard to the number of feet per pound, its tensile strength, and how to build a good wire fence. They report orders as coming in very satisfactorily for spring delivery, prospects being good for an increasing trade in their Braided Fence Wire, Patent Hollow Cable Wire Clothes Lines, of which four sizes are made, and their Patent Braided Wire Box Straps.

It will be observed that F. V. Wooster, 68 Beverly street, Boston, Mass., illustrates his Whiffletree Hooks and other goods in his advertisement on page 77. Mr. Wooster emphasizes the quality and advantages of these Hooks, and remarks that while so much depends on the Whiffletree Hooks when drawing a load up hill and on the Shaft Hooks when going down hill, yet many carriage builders will use the cheapest they can get, thereby saving about 1 cent in the cost of a single carriage, but greatly increasing the liability of accident.

Beck & Gregg Hardware Company, Atlanta, Ga., occupied their former store, at 2 and 4 South Pryor street, for 17 years, but their present location, Nos. 9, 11 and 13 North Pryor street, gives them much larger quarters and better facilities for handling the business. Their present floor space is 30,000 square feet, an increase of 50 per cent. on their former floor space, but they refer to this as giving them no more room than they require for their present business. This is a gratifying indication of the growth of their trade. They issue a very convenient condensed price list of Wrought-Iron Pipe, Fittings, &c., in which small cuts are given of the different Fittings mentioned, with which it may be presumed that many of their customers are not sufficiently familiar to recognize the goods simply by the technical name. Attention is also called to their stock of Globe, Angle, Check, Safety and Pop Valves, Inspirators, Injectors, Steam Jets, Dean's Steam Pumps, Hydraulic Rams, &c. They also issue a card giving new standard price list of Leather and Rubber Belting.

By a typographical error in our last issue the address of the Anderson Bolt Works was given as Anderson, Md., instead of Anderson, Ind., the correct location. They there manufacture Common Carriage Bolts, Machine Bolts, Tap Bolts, Bolt Ends, Coach Screws, Skein Screws,

Bridge and Roof Bolts and Nuts and Washers in large variety. They refer to their use of natural gas fuel as enabling them to furnish a finely finished article at a low price.

Matthai, Ingram & Co., Baltimore, Md., issue a unique and daintily printed pamphlet which is admirably designed for its purpose. It opens with their greeting for the new year, "Good Cheer, Good Business, Good Health," and the pages which follow are devoted to a representation of the progress which has been made in the manufacture of Tinware, their facilities for producing their varied line of goods, illustration of their factory buildings and office, salesrooms, &c. On opposite pages are representations of the method of manufacture "Then" and "Now," the former representing a Knight of the Bench in the period from 1647 to 1872, and the latter a stamping machine of the present day. In describing the old time method they say:

Making an average of 36 Baking Pans per day seems like a small number; but THEN you see the "artist" had to depend on his muscle with but mallet and stake. True, their working hours were longer, but during political campaigns when the "boss" was out arms became weary and tongues would work; but as long as the "average" was kept up nothing more was required.

In regard to the present methods, in answer to the inquiry, What is required? they say:

Brains to originate and construct suitable machines for making better goods, more goods, novel goods. We have many such, and the attending artisans are not talking "tariff" or "the weather," but "while the wheels go 'round" must attend to business strictly.

Result: "Then" 36 pans per day; "Now" 500 dozen, 6000 per day. "Then" high prices; "Now" cheap enough for the poorest mechanic or most lowly cottager to indulge in.

The sheets of which this pamphlet is composed are fastened together with ribbon, the ends of which are passed around it and are used in tying it, giving it a tasty finish. They also issue a neat pamphlet in which they describe their line of new embossed goods, including Mugs, Dredge Boxes, Tea Steepers, Dippers, Dust Pans, Umbrella Stands, Trays, &c., of which illustrations are given. They announce that they expect to add new articles and new designs.

John Campbell, Manchester, N. H., is sending out circulars relating to his Wood Hitching Posts, Hitching Weights, Dumb Bells, Wood Harness Pins, Dumb Waiter Wheels, Giant Stove Truck and Standard Clothes Drier

Announcement is made that Tower & Lamont, Rochester, N. Y., together with David Eastman, formerly with J. R. Torrey & Co., and C. B. Fuller, have associated themselves together under the name of the Electric Cutlery Company, whose office will be at 91 Chambers and 73 Reade streets, New York; the factory being at Rochester, N. Y. The company also succeed to the business of Friedman & Lauterjung at the above address, and will continue the manufacture of fine Razors, Razor Strops and Cutlery of all kinds. They will manufacture and carry a complete line of the Electric Razors and Cutlery, Peters Bros.' Cutlery and the well-known Lamont Razor Strops. They are also agents for the Southington Cutlery Company. Circulars announcing these changes and giving further particulars are issued by Tower & Lamont, David Eastman and the Electric Cutlery Company.

The Niagara Stamping & Tool Company, of Buffalo, N. Y., favor us with an illustrated catalogue and price list of tinnerns' Machines and Tools and Machinery for working sheet metal, &c., which they manufacture. It is of convenient size and contains over 150 pages. Accompanying the illustration are brief descriptions pointing out the special features of the tools

and machines, and lists of sizes and prices are given in all cases. In a note to the trade they call attention to the fact that their complete illustrated catalogue, with price list, contains three distinct sections, the one before us being section A, and containing the class of goods referred to, while section B contains the power and foot presses and dies of all kinds, and section C illustrates canning machinery and implements appertaining to the canning industry. On the front page is given an extract of a report concerning their machinery exhibited at the Buffalo International Exposition.

The Safety Water Columns manufactured by the Reliance Gauge Co., Cleveland, Ohio, are sold in St. Louis by Ripley & Bronson, who have for two or three years carried a complete stock of these and other manufactures of the company, doing an extensive trade at that point.

Haines, Jones & Cadbury, of Philadelphia, are distributing a little circular bearing on the cover the compliments of the season, and giving within an account of the plan of co-operation that they have followed so successfully. The 31st of December closed the second year of profit sharing with their employees, and the sum of 6 1/2 % of each man's total wages is to be distributed the 26th of January. The total wages for 1888 amounted to \$140,000, and the dividend \$9100.

E. S. Wheeler & Co., New Haven, Conn., the American representative of Humphrey & Sparrow, Tin Plate merchants, Liverpool, Eng., ask elsewhere attention to their guaranteed Roofing Tin. They claim to have a large line of tough Roofing Plates which they offer at attractive figures to enable their customers to compete with other and cheaper forms of roofing. Inasmuch as freights West and South are the same from New Haven as New York, they hope, with their foreign connections and their low expenses, to be able to extend their business outside of New England, where they have long been known.

Krite & Kirschbaum of Collinsville, Ill., have issued a calendar for the new year designed to be used as an easel. It consists of a piece of cardboard cut to represent the outlines of a bear standing upon its hind feet. This is lithographed in dark colors to make the design more effective. The twelve leaves constituting the calendar proper are so placed as to make it appear that they are held by the bear with the claws of his forefeet. At the back is a standard or rest adapting it for use upon a table or desk.

The Carriage Builders' National Association of America, have appointed Mr. Charles A. Heergeist, editor of the *Carriage Monthly*, Philadelphia, Commissioner to the Paris Universal Exposition. The report to be furnished will be technical, and it is expected that it will be of great service to the carriage trade at large.

American Steel Scraper Company, Sidney, Ohio, issue a well-arranged 20-page pamphlet, in which descriptions are given of their Drag Revolving Wheel Scrapers, Wheelbarrows, Grading Plows, &c. The special features of the different goods are described with more than the usual fullness in such a catalogue, which will render it of the more service to the trade.

Among the Western cities Louisville, Ky., aspires to rank among the foremost in business activity and enterprise. Her bank clearances for 1888, in comparison with those of the entire decade, indicate a surprising progression. From an aggregate of about \$127,000,000 in 1879 there is an expansion exceeding \$300,000,000 in the year just expired—a fact readily accepted as a fair gauge of the volume of

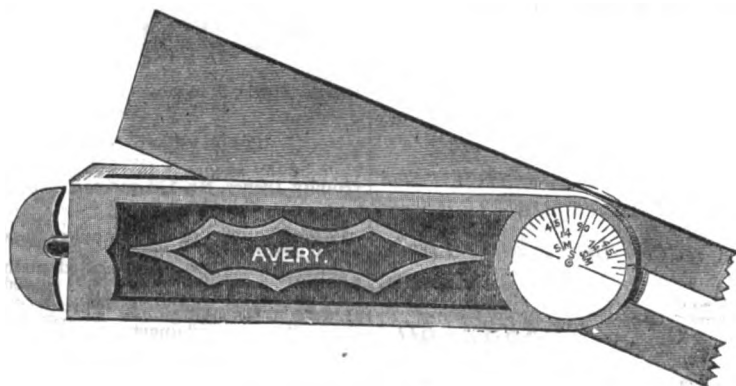
W. P. Kellogg, Troy, N. Y., who is represented by Fuller Bros., 33 Chambers

Forms used in sending remittances are still receiving attention at the hands of our readers, and, in addition to those which we have already published, we are permitted to give the one printed below, for which we are indebted to the Towers Hardware Company, Birmingham, Ala. Under an appropriately engraved heading, giving the firm name, date line and address of their correspondents, the form is as follows, it being filled out to indicate its utility :

The new Manhattan Bridge across the Harlem River is now nearly completed, and is a fine specimen of bridge architecture. It spans the Harlem from One Hundred and Eighty-first street and Tenth avenue, on Manhattan Island, on the west side to Aqueduct avenue, on that part of the cliff formerly of the estate of Mrs. William B. Ogden, on the east bank. The structure includes immense granite viaducts as approaches, arched masonry passages 60 feet wide on shore, and two steel-plate structures, each 512 feet in the span. The submarine portion of the pier on the eastern side of the river, at the outer extreme edge of the shore line, is built on a pneumatic caisson, laid on solid rock, 40 feet below mean water. The bridge roadway from its New York terminus at Tenth avenue to Aqueduct avenue on the opposite bank is 2384 feet long; the height at mean high-water mark is 151 feet 6 inches, 5 inches higher than the Statue of Liberty. The actual width is 80 feet. It is estimated that between 7000 and 8000 tons of steel and iron have been used in the construction. The land approach on the west side is walled on either side with a massive perforated granite parapet of unique and chaste design, in the apertures of which are set bronze rings handsomely lined and scrolled. The ornamental cornice rail on the steel spans is of bronze and iron. The first stone was laid on the river bank by Contractor Miles Tierney October 12, 1886. The cost of this new addition to the city's facilities is set down at \$2,600,000. The bridge is practically a new street connecting the northwestern section of the city with the great and growing city north and east of the Harlem.

Avery Flush Bevel Protractor.

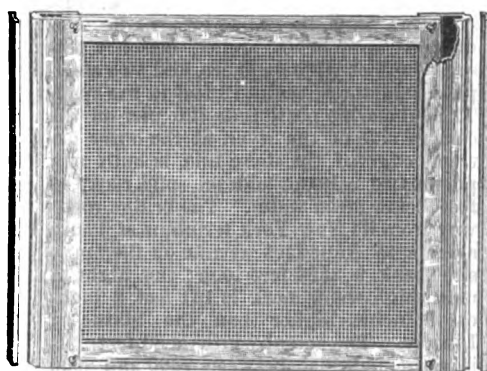
The accompanying illustration represents the special features of this tool, which is put on the market by W. G. Avery Mfg. Company, Cleveland, Ohio. The entire tool is made of metal, and is nickel plated. It will be observed that there is a thumb-nut in the end of the handle, which is for the purpose of fasten-

*Avery Flush Bevel Protractor.*

ing the blade at any desired point. This tool is made in 6, 9 and 12 inch sizes. Its simplicity, durability and convenience are the points on which the manufacturers lay emphasis.

Adjustable Window Screen.

To meet the general demand for an adjustable window screen so arranged as to do away with the necessity of removing the screen each time it is desired to close the window, E. C. Stearns & Co., Syracuse, N. Y., have put on the market their new Monarch Screen, as shown in the accompanying cut, which shows its special features. The point is emphasized that this screen is so arranged as to slide upon guides, and may be placed in position on the inside of the window and left there throughout the season, as it is so constructed that the window slides past, and may be raised or lowered without disturbing the screen. It presents the same appearance on both sides; and when extended or closed the sides have an adjustment of 4 inches, and are fastened at the required extension by a thumb-screw shown in the cut. The frames are made of maple, attractively beaded, and finished in the

*Adjustable Window Screen.*

natural wood with white transparent varnish. The cloth is described as tightly drawn and securely fastened in the frame, a uniform tension being secured by processes for which the manufacturers have obtained letters patent.

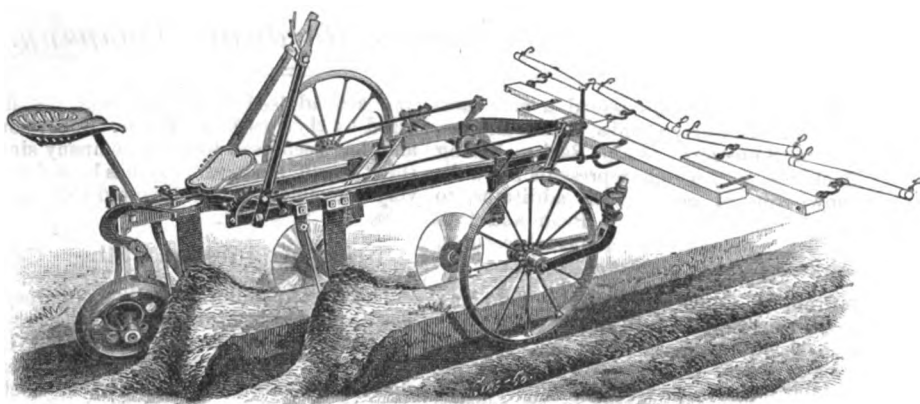
The Manhattan Bridge Company, Edmund Driggs, president, contemplate erecting another bridge across the East river, at least 130 feet above high water, no pier to be erected outside of the pier line. The

termini will be at or near the corner of Chrystie and Broome streets in this city, and Hooper street, in Brooklyn.

The Weir Tongueless Riding or Walking Three-Wheeled Gang Plow.

This gang plow is manufactured by the Weir Plow Company, Monmouth, Ill. The

frame is built upon the same principle as that of their Weir Tongueless Three-Wheeled Plow, which enables sufficient strength to be attained with the lightest possible weight. The point is emphasized that the plow is carried at all times on its wheels. It is pointed out that an angled

*The Weir Tongueless Riding or Walking Three-Wheeled Gang Plow.*

rear wheel makes landside unnecessary, lessening draft and friction. The rear wheel is rigid, and the front wheels are casters for the purpose of facilitating turning, and the company explain that if the corners of land are slightly rounded plowing may be continuous around the field without lifting the bottoms out of the ground in turning, something which they refer to as unaccomplished heretofore by any gang plow. No change whatever is required when using it as a walking plow. Either three or four horses can be hitched abreast and the off horse walk in the furrow in either case. Lightness of weight and draft, simplicity and excellence of construction, ease and perfection of work, are advantages to which reference is made. A tongue can be used, but it is not essential, and is only furnished on a special order.

The capacity of the Brooklyn bridge is to be enlarged by adopting the Barnes-Marin plan, which consists, so far as the New York terminus is concerned, in widening the station until it covers both wagon ways, thus making room for two additional tracks, one on the north side for in-bound trains, and the other on the south side for trains loading for Brooklyn. The new tracks will be arranged as sidings, joining the main lines a short dis-

tance from the station. The present cable will supply all the motive power needed. In-coming trains will reach the station by gravity after dropping the cable. Out-going trains on the south switch will be started by an engine. Those on the main line will continue to pick up the cable as they do now. This arrangement may answer for a makeshift, until another bridge becomes a permanent necessity.

The enormous business of the New York Post Office is shown by the annual report of Postmaster Pearson. In all departments there is an increase compared with last year. The weight of postage stamps sold was 18 tons, and the total weight of mail matter received and dispatched daily was 248 tons. The total receipts of the office were \$5,163,000, and the net revenue \$3,270,000. In the money order department the year's business amounted to \$87,299,000. Foreign mails frequently include as many as 800 bags, and require from seven to twelve two-horse trucks for their transportation.

The steel railroad ferry-boat built at Cleveland at a cost of \$325,000, for river service at Detroit, is intended to be a powerful ice-breaker, her bow for several feet being of nearly solid steel. She has four steel boilers, 11 feet 6 inches, 16 feet long, or 4½ feet longer than the longest ordinary boilers on the lakes. They have two domes 20 feet long and 48 inches in diameter, and one dome 10 feet long and 6

feet in diameter. The boilers will furnish steam for six cylinders; two 28 x 48 inches on each side for side wheel engines, and two cylinders 28 x 36 inches for a propeller engine, each with separate condensers. The cylinders are double low pressure with horizontal engines. The latter have two steel spur gears 16 feet in diameter, all cut teeth, and two steel spur pinions 5 feet 6 inches in diameter, also all cut teeth. Her engines are all constructed from original patterns made by her builders, the Cleveland Shipbuilding Company, and the length of the vessel is 280 feet over all, 45 feet 6 inches beam, 17 feet 3 inches hold.

Probably the oldest timber in the world which has been subjected to the use of man is that found in the ancient temple of Egypt, in connection with stonework which is known to be at least 4000 years old. This, the only wood used in the construction of the temple, is in the form of ties, holding the end of one stone to another. When two blocks were laid in place an excavation about 1 inch deep was made in each block, in which a tie, shaped like an hour-glass, was driven. It is, therefore, very difficult to force any stone from its position. The ties appear to have been of the timarisk or Shittim wood, of which the ark was constructed.

A New Punch.

The accompanying illustration represents a new punch which is being put on the market by L. A. Sayre, Newark, N. J. The manner in which the punch is reamed out on the side to permit the escape of the

safety position. The hand or pawl which rotates the cylinder has two working points to engage the cylinder ratchet, and by an ingenious construction this pawl also serves as cylinder bolt, and positively prevents any further rotation after one of the chambers in the cylinder coincides

the newspaper box, so that very large packages can be put in easily. The usual slots on the side are arranged to drop letters into the letter compartment. The bottom of the box is composed of two drop doors, hinged at the ends and opening in the middle. When the collector unlocks the box these doors drop, and the entire contents fall into his bag, which is hung on a hook on the bottom of the box. The contents of the newspaper compartment drop at the same time, a lever connected with the lower doors causing the bottom of the newspaper compartment to open and close with them. Panels are arranged on the front of the box on which to paste the schedule of collection hours. A dial in the center of the front exposes the hour of the next collection, and changes automatically with the opening and closing of the bottom doors. A dial in one of the upper corners gives the day of the week, and changes automatically when the last collection is made for the day. These dials are detectives to show whether the box has been tampered with. If an unauthorized person should by any means open the box and abstract the contents, the hour of collection will change when he closes the box,

L. A. SAYRE.

A New Punch.

punched out matter is sufficiently shown in the cut. The quality of the punch and its efficiency in use are points which are made in regard to it.

The Colt's New Double-Action Self-Cocking Revolver.

The new Colt's double action self-cocking revolver, which is represented in the accompanying illustrations, Figs. 1 and 2, has been added by the Colt's Patent Fire Arms Mfg. Company, Hartford, Conn., to their line of revolving pistols. Fig. 1 gives a view of it as closed, and Fig. 2 shows it with the cylinder swung out, the ejector being represented in the act of throwing out the empty shells, after which it will be automatically returned to its place in the cylinder, which will then be ready for loading. This revolver obviously differs from all others in the market, but while in some of its new features it is a departure from the other pistols of this company's make, it is claimed to retain those qualities of accuracy, strength and simplicity which have given the Colt revolvers the high position they occupy for reliability and endurance. Its cylinder contains six chambers. In order to facilitate the loading of cartridges and to allow the simultaneous ejection of the emptied cartridge shells, the cylinder is so mounted upon a crane pivoted in frame below the cylinder seat that, on drawing the cylinder latch to the rear, the cylinder swings to the left and downward out of its seat in the frame; in this position all the chambers are presented for loading, while pressure against the end of the ejector-rod under the barrel ejects all the shells. When, after ejecting and loading, the cylinder is returned to its seat in the frame, the cylinder latch automatically secures it there. By this construction it is pointed out that all the facilities for loading and ejecting are obtained without sacrificing the important feature of a solid frame, such as all modern Colt pistols show, there being no hinge or joint in the frame between the barrel and stock, the wearing of which might disturb the accuracy of the pistol. The ejector is effective, its working simple, so as to be understood at once, while the absence of complicated and delicate parts prevents it from getting out of order. The lock mechanism also is very simple and strong. The hammer may be cocked by the thumb or by the trigger, and after firing it rebounds, and is positively locked in this safety position, so that it cannot strike the primer of a cartridge until it is again cocked. The cylinder cannot be swung out of the frame unless the hammer is in its safety position, and the act of swinging the cylinder out of the frame automatically locks the trigger and the hammer in this position. Thus premature discharges during manipulation are prevented, as also accidental discharges from blows such as result from a fall, &c. The falling of the hammer from any position cannot fire a shot unless the trigger is fully pulled back at the same time, as only then the hammer can fall beyond the

with the bore of the barrel. The cylinder latch prevents its backward rotation. We are advised that it was the feature of the jointless, solid frame, combined with the simultaneous ejection and its other good qualities, which caused the officers of the Bureau of Ordnance, after a series of most searching trials, to adopt this revolver for the service of the United States Navy in preference to any and all others, and the Colt Company are at present filling an order from the Navy Department for a large number of these revolvers. The Navy pistol has a barrel of 6 inches length;



Fig. 1.—Colt's New Double Action Self-Cocking Revolver.—
Half Size.

the same revolver will be made for the trade with a shorter barrel.

New Design for a Street Letter-Box.

Two Chicago mechanics, named T. Regensteiner and M. Rosenfield, have invented a most ingenious letter-box, which they propose to submit to the Post Office

and the collector will observe this on his next round. A gong rings whenever the doors are opened or closed, and is intended to attract the attention of persons in the vicinity. If a thief should endeavor to reset the dials to get them into their proper order and conceal his depredations from early detection, the constant and unusual ring of the gong would probably attract the attention of a

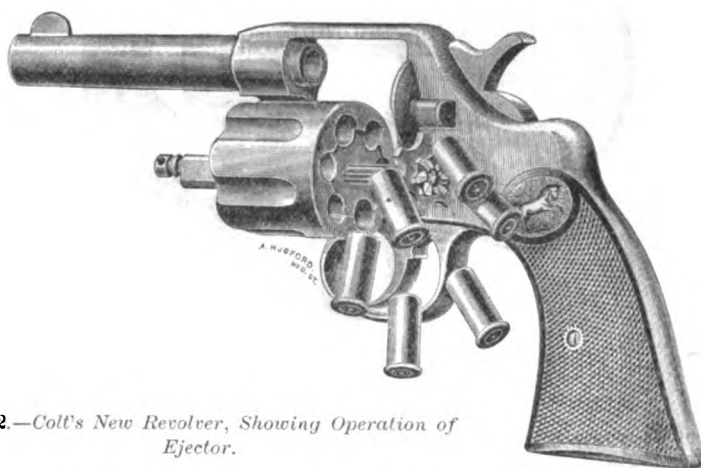


Fig. 2.—Colt's New Revolver, Showing Operation of
Ejector.

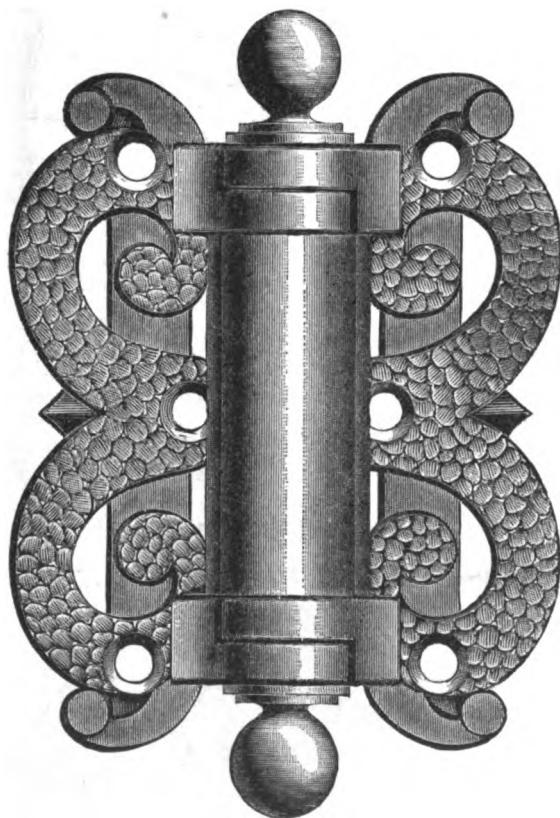
Department in competition for the contract soon to be awarded. The box is of regulation size, constructed of cast iron, and handsomely finished. It contains two compartments, the upper one for newspapers and the lower one for letters. A hanging door extends the full width of

policeman. The dials have other uses which are obvious, but one of the most important is that they would show whether collections were being made promptly or whether a box was neglected. A place is arranged for a number, the intention being to number all the boxes in a city, so as to

make it easy to report when anything has occurred to one of them. The mechanism of the box is of a very simple character, being operated by levers, ratchets and toothed wheels, which are not apt to get out of order even with long use. The persons interested with the inventors are Louis Benjamin, Henry Rosenfield and Jacob Newman, all of Chicago. A sample box is on exhibition at the offices of Block, Pollack & Co., rooms 70 and 71, Commerce Building, Pacific avenue, Chicago.

The Hold-Back Hinge.

The accompanying cut represents a new hold-back spring hinge which has just been perfected and placed on the market by E. C. Stearns & Co., Syracuse, N. Y., and which they state is the result of careful study with a view of remedying the faults and strengthening the parts which in other hold-back hinges have been found weak. They explain that the tendency of hold-back hinges to get out of order, owing to their complication of parts, has been avoided in this hinge by making it in three parts only, so that under no combination of circumstances can it get out of order, while at the same time it is equally well adapted for use on either right or left-hand doors and will hold the door either open or closed. The wings are cast, as shown in the illustration, in imitation of hammered work, and japanned. The springs are of steel, nickel plated, described as uniformly tempered and to be depended upon for the regularity and certainty of their operation. The hinge has



The Hold-Back Hinge.

a surface of $3\frac{1}{2}$ inches and is said to possess great strength.

The same firm are also introducing a single-spring hinge with variable tension, which may be used on either right or left-hand doors. It is of the same size and general design as the hold-back. It is especially strong and is made with either a silvered or japanned spring. This hinge is represented, it will be observed, in their advertisement on page 60.

The Sjöström Barb Fence.

A barb fence, notable both for the originality of its design and of the methods for its manufacture, is proposed by Johannes Sjöström, of Brooklyn, which we

wire into a loop at both ends, our engraving showing part of a length. It is not claimed that this barb fence can take the place of the ordinary barbed wire for its ordinary purposes. It is claimed, however, that it is sufficiently striking to keep

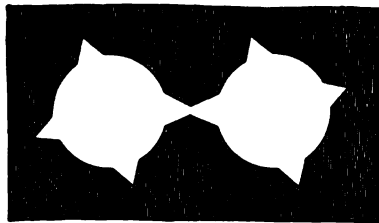


Fig. 1.



Fig. 2.



Fig. 3.

The Sjöström Barb Fence.

illustrate in the accompanying engravings. Sheet metal is cupped, the cups being placed in twos at regular intervals from one another. By a special machine the metal is punched in the manner shown in Fig. 1, the cups occupying the center of the spaces. Automatically the two cups connected by the hinge shown are doubled

stock from approaching it at all, and that it is light and strong. Painted in different colors and arranged in a simple way, it can be made quite ornamental. It can be readily attached to either wooden or iron supports.

The work of renewing the roadway bridges and the two drawbridges on the Newark and New York Branch of the New Jersey Central Railroad is being pushed forward rapidly. The drawbridge over the Hackensack has been completed with the exception of the engine-house. The turnout track and temporary draw for the other are nearly finished. The old draws were built over 20 years ago. They are of the Moseley type, being bow-string girders, the free ends of which are suspended during swinging by guys from a central gallows frame. In the roadway bridges all the compression members were of cast iron. The floor beams were carried by stirrups passing over the foot of the columns. The renewing is being done by Cofrode & Saylor, of Philadelphia, and by the New Jersey Steel and Iron Company, of Trenton, N. J.

The improvement in ocean freights first noticed about a year ago is now supposed to have become permanent. The previous depression, comprising a period of four or five years, gave place to an increasing demand for tonnage, which has gradually become more urgent, until at length we find all the shipyards on the Atlantic coast and on the lakes filled with vessels in process of construction. Iron ship builders are pressed with work as never before. The extent to which a change has been effected may be gathered from the fact that, as compared with this time last year, the rates for grain per steamer to the United Kingdom were 2d., against $4\frac{1}{2}$ to 5d. now; to Adelaide, per sail, general cargo, 21 cents per cubic foot, against 27 $\frac{1}{2}$ cents; to San Francisco via Cape Horn, coal, \$7 per ton, against \$12, and lumber, \$15, against \$25; case oil to Japan, 30 cents, against 40 cents. These quotations are sufficient to indicate how much the cost of transportation has advanced.

Industrial homes for released prisoners are being established in our principal cities. One was opened in Philadelphia this week, to teach the trades. At the home in this city last year 2000 convicts were assisted in finding employment.

CURRENT HARDWARE PRICES.

JANUARY 16, 1889.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers, at the figures named.

Ammunition.—

Caps, Percussion, \$1000—

Hicks & Goldmark's	
F. L. Waterproof, 1-10's.....	50¢
E. B. Trimmied Edge, 1-10's.....	25¢
E. B. Grad. Edge, Cent. Fire.....	25¢
Double Waterproof, 1-10's.....	7½¢
Musket Waterproof, 1-10's.....	50¢
G. D.	25¢
S. B.	80¢

Union Metallic Cartridge Co.

F. C. Trimmied.....	50¢
F. L. Ground.....	25¢
Cent. Fire Ground.....	25¢
Dbl. Waterproof.....	7½¢
Dbl. Waterproof, in 1-10's.....	14¢
S. B. Genuine Imp.orted.....	45¢
Eley's E. B.	54¢
Eley's D Waterproof, Central Fire.....	\$1.50

Cartridges.

Rim Fire Cartridges.....	50¢
Rim Fire Military.....	10¢
Cent. Fire, Pistol and Rifle.....	15¢
Cent. Fire, Military and Sporting.....	15¢
Blank Cartridges, except 22 and 35 cal., additional 10% on above discounts.	
Blank Cartridges, 22 cal.....	\$1.75, dis 2%
Blank Cartridges, 35 cal.....	\$3.50, dis 2%
Primed Shells and Bullets.....	15¢
B. B. Caps, Round Ball.....	\$1.75, dis 2%
B. B. Caps, Con. Ball. Swgd.....	\$2.00, dis 2%

Primers.

Berdan Primers.....	\$1.00, dis 2%
E. L. Caps (for Sturtevant Shells).....	\$1.00, dis 2%
All other Primers.....	\$1.20, dis 2%

Shells—

First quality, 4, 8, 10 and 12 gauge.....	25¢
First quality, 14, 16 and 20 gauge (10 list).....	30¢
Star, Club, Rival and Climax brands, 10 and 12 gauge.....	33¢
Club, Rival and Climax brands, 14, 16 and 20 gauge.....	30¢
Seibold's Comb. Shot Shells.....	15¢
Brass Shot Shells, 1st quality.....	60¢
Brass Shot Shells, Club, Rival, Climax.....	60¢
I X L, 10 and 12 gauge.....	40¢
"Special," 16 gauge.....	30¢
"Special," 10 and 12 gauge.....	40¢
Fowler's Pat.....	32¢

Shells Loaded—

A. M. Co. List No. 19, 1887.....	20¢
U. M. C. List, December, 1888.....	40¢

Wads—

U. M. C. & W. R. A.—B. E., 11 up.....	\$2.00
U. M. C. & W. R. A.—B. E., 9 & 10.....	2.50
U. M. C. & W. R. A.—B. E., 7 & 8.....	2.80
U. M. C. & W. R. A.—P. E., 11 up.....	3.10
U. M. C. & W. R. A.—P. E., 9 & 10.....	4.00
U. M. C. & W. R. A.—P. E., 7 & 8.....	4.90
Eley's B. E., 11 up.....	\$1.75
Eley's B. E., 9 & 10.....	2.80

Anvils—

Eagle Anvils.....	10¢
Peter Wright's.....	95¢
Armstrong's Anvil.....	85¢
Armstrong's Mound Hole, Extra.....	11¢
Trenton.....	95¢
Wilkinson's.....	95¢
J. & Riley Carr, Pat. Solid.....	11¢

Anvil Vise and Drill—

Millers Falls Co.....	\$18.00, dis 20%
Cheney Anvil and Vise.....	25%
Allen Combined Anvil and Vise.....	\$3.00, dis 40%
Moore & Barnes Mfg. Co.....	33%

Apple Parers—

Advance.....	50¢
Antrim Combination.....	50¢
Baldwin.....	52¢
Champion.....	72¢
Eureka, 1888.....	17.00
Family Bay State.....	12.00
Gem.....	5.25
Gold Medal.....	5.00
Hudson's New '88.....	3.75
Ideal.....	4.75
Improved Bay State.....	30.00
Little Star.....	5.00
Monarch.....	13.50
New Lightning.....	5.50
Orion.....	4.00
Penn.....	4.00
Perfection.....	4.00
Pomona.....	4.00
Rocking Table.....	6.00
Turntable.....	4.50
Victor.....	13.50
Waverly.....	4.50
White Mountain.....	4.25
72.....	5.75
76.....	5.75
78.....	5.50

Augers and Bits—

Douglase Mfg. Co.....	
Wm. A. Ives & Co.....	70%
Humphreysville Mfg. Co.....	
French, Swift & Co. (F. H. Beecher).....	55%
Cook's, Douglas Mfg. Co.....	55%
Cook's, N. H. Copper Co.....	50¢
Ives' Circular Lip.....	80%
Patent Solid Head.....	30%
C. E. Jennings & Co., No. 10, extension.....	40%
Up.....	80%
C. E. Jennings & Co., No. 30.....	80%
C. E. Jennings & Co., Auger Bits, 1/2 set, 2 3/4 quarters, No. 5, 35; No. 30, \$3.50.....	
Lewis' Patent Single Twist.....	45%
Jennings' Augers and Bits.....	25%
Imitation Jennings' Bits.....	60¢
Pugh's Black.....	20%
Car Bits.....	50¢
L'Hommedieu Car Bits.....	15¢
Fortner Pat. Auger Bits.....	10%

Hollow Augers—

Ives'.....	25¢
French, Swift & Co.....	10¢
Douglase.....	10¢
Bonney's Adjustable.....	40¢
Stearns'.....	20¢
Ives' Expansive, each \$4.50.....	50¢
Universal Expansive, each \$4.50.....	20¢
Wood's.....	25¢

Expansive Bits—

Clarks' small, \$18; large, \$26.....	
Ives' No. 4, 1/2 doz \$50.....	35¢
Swan's.....	40%
Stearns' No. 1, \$25; No. 2, \$32.....	35%
Stearns' No. 2, \$48.....	20%

Gimlet Bits—

Common.....	\$2.75
Diamond.....	\$1.10
"Bee".....	25¢
Double Cut, Shephardson's.....	45¢
Double Cut, Ct. Valley Mfg. Co.....	30¢
Double Cut, Hartwell's.....	35¢
Double Cut, Douglas.....	40¢
Double Cut, Ives.....	60¢

Bit Stock Drills—

Morse Twist Drills.....	50¢
Standard.....	50¢
Cleveland.....	50¢
Syracuse, for metal.....	50¢
Syracuse, for wood (wood list).....	30¢
Williams' or Holt's, for metal.....	50¢
Williams' or Holt's, for wood.....	40¢

Ship Augers and Bits—

L'Hommedieu's.....	15¢
Watrous.....	15¢
Snell's.....	15¢
Snell's Ship Auger Pat'n Car Bits.....	15¢

Awl Hafts—

Sewing, Brass Ferrule.....	\$3.50
Pat. Sewing, Short.....	\$1.00
Pat. Sewing, Long.....	\$1.20
Pat. Peg, Plain Top.....	\$1.00
Pat. Peg, Leather Top.....	\$1.20

Awls, Brad Sets, &c—

Awls, Sewing, Common.....	\$1.70
Awls, Shouldered Peg.....	\$2.45
Awls, Pat. Peg.....	\$3.65
Awls, Shouldered Brad.....	\$2.70
Awls, Handled Brad.....	\$7.50
Awls, Handled Scratch.....	\$7.50
Awls, Socket Scratch.....	\$1.50

Awl and Tool Sets—

Aiken's Sets, Awls and Tools, No. 20.....	\$10.00
Fray's Adj. Tool Hds., Nos. 1, 2, 3, 4.....	\$12.00
Miller's Falls Adj. Tool Hds., Nos. 1, 2, 3, 4.....	\$12.00
Henry's Combination Haft.....	\$18.00
Brad Sets, No. 42, \$10.50; No. 43, \$12.50.....	
Brad Sets, Stanley's Excelsior, No. 1.....	\$7.50
Brad Sets, Stanley's Excelsior, No. 2.....	\$4.00
Brad Sets, Stanley's Excelsior, No. 3.....	\$5.50

Axes—

First quality.....	\$5.00
Others.....	\$5.50

Axle Grease—

Fraser's, in bulk.....	Keg \$4.45, Pail \$4.50
Fraser's, in boxes.....	\$4.50
Dixon's Everlasting, in bxs.....	\$1.20
Dixon's Everlasting.....	10¢
Lower grades, special brands.....	\$5.50

Axles—

No. 1.....	4¢
Nos. 7 to 18.....	50¢
Nos. 19 to 22.....	60¢
National Wrought Steel Tubular Self-Oiling.....	
Standard Farm (1 to 5) and Special Farm (A1 to A5).....	
Less than 10 sets.....	33%
Over 10 sets.....	33%
X Strong Exp. (6 to 9) and XX Strong Truck (10 to 15).....	
Less than 10 sets.....	10%
Over 10 sets.....	10%

Bag Holders.

Sprengle's Pat.....	\$18, dis 60%
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Balances—

Spring Balances.....	50%
Common 24-lb.....	\$1.50
Chatillon's Spring Balances.....	50%
Chatillon's Circular Spring Balances.....	60%

Bells—

Hand.....	70¢
Light Brass.....	60¢
Extra Heavy.....	60¢
White Metal.....	60¢
Silver Chime.....	35%
Globe (Cone's Patent).....	25¢

Door—

Gong, Abbe's.....	33%
Gong, Yankee.....	45%
Gong, Barton's.....	40%
Crank, Taylor's.....	25%
Crank, Brooks's.....	50%
Crank, Cone's.....	10%

Crank, Connel's.....	20¢
Lever, Sargent's.....	60¢
Lever, Taylor's Bronzed or Plated.....	net
Lever, Taylor's Japanned.....	25¢
Lever, R. E. M. Co.'s.....	50¢
Pull, Brook's.....	50¢
Pull, Western.....	25¢

Cole—

Common Wrought.....	60¢
Western.....	20¢
Western, Sargent's list.....	70¢
Kentucky, "Star".....	20¢
Kentucky, Sargent's list.....	70¢
Dodge, Genuine Kentucky.....	40¢
Texas Star.....	50¢
Call.....	40¢
Farm Bells.....	\$3.50
Steel Alloy Church and School Bells.....	40%

Bellows—

Blacksmith's.....	50¢
Molders.....	40¢
Hand Bellows.....	40¢

Belting, Rubber—

Common Standard.....	70¢
Standard.....	70¢
N. Y. B. & P. Co., Carbon.....	60¢
N. Y. B. & P. Co., Diamond.....	50¢

Bench Stops—

Morrill's.....	\$2.50
Hotchkiss's.....	\$5.00
Weston's.....	\$1.00
McGill's.....	\$3.00

Bits—

Auger, Gimlet, Bit Stock, Drills, &c., see Augers and Bits.	
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Bit Holders—

Extension, Barber's.....	\$15.00
Extension, Ives.....	\$20.00
Diagonal.....	\$24.00
Angular.....	\$24.00

Blind Adjusters—

Domestic.....	\$3.00
Excelsior.....	\$10.00
Washburn's Self-Locking.....	20¢

Blind Fasteners—

Mackrell's.....	\$1.00
Van Sand's Screw Pattern.....	\$15.00
Van Sand's Old Pattern.....	\$15.00
Washburn's Old Pattern.....	\$9.00
Washburn's Self-Locking.....	\$9.00
Austin & Eddy, No. 2008.....	\$9.00
Security Gravity.....	\$9.00

Blind Staples—

Barbed, 1/4 in. and larger.....	7¢
Barbed, 3/4 in.....	8¢

Blocks—

Cleveland Block Co., Mal. Iron.....	50%
Novelty Tackle Blocks, Mal. Iron.....	50%

Bolts—

Door and Shutter.....	70¢
Cast Iron Barrel, Square, &c.....	70¢
Cast Iron Shutter Bolts.....	70¢
Cast Iron Chain (Sargent's list).....	65¢
Ives' Patent Door Bolts.....	60%
Wrought Barrel.....	70¢
Wrought Square.....	70¢
Wrt Shutter, all Iron, Stanley's.....	60¢
Wrt Shutter, Brass Knob.....	40¢
Wrt Shutter, Sargent's list.....	60¢
Wrt Sunk Flush, Sargent's list.....	55¢
Wrt Sunk Flush, Stanley's list.....	50¢
Wrt Sunk Flush, Com'n.....	55¢

Carriage, Machine, &c—

Com. list June 10, '84.....	75¢
Genuine Eagle, list Oct., '84.....	75¢
Phila. pattern, list Oct. 7, '84.....	75¢
R. B. & W., old list.....	70%
Machine, according to size.....	75¢
Bolt Ends, according to size.....	75¢

Tire—

Common, list Feb. 28, '83.....	70%
P. C. B. & N. Co., Empire, list Feb. 28, '83.....	70%
P. C. B. & N. Co., Phila., list Oct. '84.....	82%
P. C. B. & N. Co., Keystone, Philadel., list Oct. '84.....	80%
P. C. B. & N. Co., Norway, Philadel., list Oct. '84.....	75%
Am. S. Co., Norway, Phil., list Oct. 16, '84.....	75%
Am. S. Co., Eagle, Phil., list Oct. 16, '84.....	80%
Am. S. Co., Philadel., list Oct. 16, '84.....	82%
Am. S. Co., Bar State, list Feb. 28, '83.....	70%
R. B. & W., Philadel., list Oct. 16, '84.....	82%
R. E. Mfg. Co.....	70%

Stove and Plow—

Stove.....	62%
Plow.....	60%
Am. S. Co. Stove, Annealed.....	62%
R. B. & W. Plow.....	55%
R. B. & W. Stove.....	62%
R. B. & W. Co., Stove.....	62%

Borax—

Without.....	9¢
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Boring Machines—

Without.....	
Augers, Upright, Angular, Dis.....	\$5.50
Douglase.....	\$6.75
Snell's, Rice's Pat.....	5.50
Jennings.....	5.50
Other Machines.....	2.35
Phillips' Patent with Augurs.....	7.00

Bow Pins—

Humason, Beckley & Co.'s.....	60¢
Sargent & Co.'s.....	\$17 and \$18, dis 60%
Peck, Stow & W. Co.....	50¢

Braces—

Backus, Nos. 110 to 114 and 31 to 33.....	60¢
Backus, Nos. 6, 8, 12, 14.....	60¢
Backus, Nos. 16, 18, 20, 22, 7, 9, 11.....	70¢

Barber's, Nos. 10 to 16.....	50%
Barber's, Nos. 30 to 33.....	50%
Barber's, Nos. 40 to 63.....	50%
Barker's, Nos. 8, 10 and 12.....	75%
Barker's, Plated, Nos. 8, 10 and 12.....	65%

Cards—

Horse & Curry.....10&10&10&10&10
Cotton.....New list, Aug. 1888, 10&10&10
Wool.....New list, Aug. 1888, 10&10&10

Carpet Stretchers—

Cast Steel, Polished.....\$ dos \$2.25
Cast Iron, Steel Points.....\$ dos \$0.80
Socket.....\$ dos \$1.75
Bullard's.....\$ dos \$2&10&10

Carpet Sweepers—

Bissell No. 5.....\$ dos \$17.00
Bissell No. 7 New Drop Pan.....\$ dos \$12.00
Bissell, Grand.....\$ dos \$36.00
Grand Rapids.....\$ dos \$24.00
Crown Jewel, No. 1, \$18.00; No. 2, \$20.00
Magic.....\$ dos \$15.00
Jewel.....\$ dos \$17.00
Improved Parlor Queen, Nickel.....\$ dos \$27.00
Improved Parlor Queen, Japanned.....\$ dos \$24.00
Excelstor.....\$ dos \$22.00
Garland.....\$ dos \$18.00
Parlor Queen.....\$ dos \$24.00
Housewife's Delight.....\$ dos \$15.00
Queen.....\$ dos \$18.00
Queen, with band.....\$ dos \$30.00
King.....\$ dos \$18.00
Weed, Improved.....\$ dos \$18.00
Hub.....\$ dos \$16.00
Cog Wheel.....\$ dos \$22.00
Conqueror.....\$ dos \$22.00
Easy.....\$ dos \$22.00
Monarch.....\$ dos \$22.00
Goshen.....\$ dos \$21.00
Advance.....\$ dos \$18.00
Ladies' Friend, No. 1, \$ dos \$15.00
No. 2.....\$ dos \$16.00
American.....\$ dos \$15.00
Grand Republic.....\$ dos \$35.00

Cartridges—
See Ammunition.**Casters—**

Bed.....New list:
Plate.....Brass.....55&55&55
Shallow Socket.....Others.....60&60&60
Deep Socket.....40&10
Yale Casters, list May, 1888.....30&10&40
Yale, Gem.....60&60&60
Martin's Patent (Phoenix).....45&10&50
Payson's Anti-friction.....60&60&10
"Giant" Truck Casters.....10&10&5
Stationary Truck Casters.....45&10

Cattle Leaders—

Humason, Beckley & Co.'s.....70%
Sargent's.....60%&10
Hotchkiss.....80%
Peck, Stow & W. Co.....50&10

Chain—

Trace, 6-10-2, exact, \$ pair, \$1.03
Trace, 6-10-3, exact, \$ pair 92¢
Trace, 7-10-2, exact, \$ pair \$1.11
Trace, 7-10-3, exact, \$ pair \$1.11

NOTE.—Traces, "Regular" sizes, 3/4 net
Log, Fifth, Stretcher, and other fancy
Chains, list Nov. 1, 1888

American Coll.....3-16 5-16 3/4
In cash lots.....\$8.75 6.25 5.00 4.50
American Coll.....7-16 3/4 3/4
In cash lots.....\$4.40 4.00 3.75 3.50
Less than cash lots, add 1/4¢ per lb.

German Coll, list of June 20, 1887.....\$10&10&50&50

German Halter Chain, list of June 22, 1887.....50&10&50&50
Covert Halter, Hitching and Breast.....50&25

Covert Traces.....35&25

Oneida Halter Chain.....90&80&50

Galvanized Pump Chain.....75&75&50

Jack Chain, Iron.....75&75&50

Jack Chain, Brass.....70&70&50

Chalk—

White.....\$ gr 50¢
Red.....\$ gr 70¢
Blue.....\$ gr 85¢
White Crayons.....\$ gr 12¢&12¢, dis 10%

Chalk Lines—
See Lines.**Chisels—**

Socket Framing and Firmer.....

P. S. & W.....

New Haven and Middlesex.....75&50&75&10%

Mix.....

Ohio Tool Co.....

Buck Bros.....

Merrill.....60&10&60&10&50

L. & I. J. White.....30&30&25

Witherby & Douglass.....75&50&50

Tanged Firmers.....40&10

Tanged Firmers, Butchers'.....\$4.75&5.00

Tanged Firmers, Spear & Jackson's.....\$5 to 2

Tanged Firmers, Buck Bros.....16&19¢

Chucks—

Beach Pat.....each, \$3.00, dis 20%

Morse's Adjustable.....each, \$7.00, dis 20%

Danbury.....each, \$6.00, dis 30&30&50

Syracuse, Balz Pat.....25%

Clamps—

Providence Tool Co.'s Wrought Iron.....25%

Adjustable, Gray's.....20%

Adjustable, Lambert's.....20%

Adjustable, Snow's.....40&50

Adjustable, Hammers.....15%

Adjustable, Stearn's.....20&10

Stearn's Adjustable Cabinet and Corner.....20&10

Cabinet, Sargent's.....60%&10

Carriage Makers', Sargent's.....70&10

Eberhard Mfg. Co.....40&50&40&10

Warner's.....40&10&40&10

Saw Clamps, see Vises.

Clips—

Norway, Axle, 1/4 & 5-16.....55&50&50

Second grade Norway Axle, 1/4 & 5-16.....55&50

Superior Axle Clips.....60%&50&60%&50&50

Norway Spring Bar Clips, 5-16.....60&50&50
Wrought-Iron Felloe Clips.....\$ b 5¢
Steel Felloe Clips.....\$ b 5¢
Baker Axle Clips.....25%

Cocks, Brass.

Hardware list.....40. &10&25

Coffee Mills—

Box and Side, list revised Jan. 1, 1888.....

American, Enterprise Mfg. Co. 20&10&30%

The "Swift," Lane Bros.....20&10%

Compasses, Dividers, &c—

Compasses, Callipers, Dividers.....70&70&10

Bemis & Call Co.'s Dividers.....60&50

Bemis & Call Co.'s Compasses & Callipers.....50&50

Bemis & Call Co.'s Wing & Inside or Outside.....50&50

Bemis & Call Co.'s Double.....60%

Bemis & Call Co.'s Call's Pat. Inside.....30%

Excelsior.....50%

J. Stevens & Co.'s Callipers and Dividers.....25&10

Starrett's Spring Callipers and Dividers.....25&10&10

Starrett's Lock Callipers and Dividers.....25&10

Starrett's Combination Dividers.....25&10

Coopers' Tools—

Bradley's.....20%

Barton's.....30&30&50

L. & I. J. White.....20&25

Albertson Mfg. Co.....25%

Beatty's.....40&40&50

Sandusky Tool Co.....30&30&50

Corkscrews—

Humason & Beckley Mfg. Co. 40&40&10

Lough's Pat.....35%&35%&50

Howe Bros & Hulbert.....35%

Corn Knives and Cutters—

Bradley's.....10%

Wadsworth's.....25%

Cradles—

Grain.....50&25

Crow Bars—

Cast Steel.....\$ b 4¢

Iron, Steel Points.....\$ b 3 1/2¢

Curry Combs—

Fitch's.....50&10&50&10&10

Rubber.....per doz \$10.00, dis 20%

Perfect.....50%

Curtain Pins—

Silvered Glass.....net

White Enamel.....net

Cutlery—

Beaver Falls & Booth's.....33%

Wostenholme.....\$7.75 to 2

Dampers, &c—

Dampers, Buffalo.....50%

Buffalo Damper Clips.....50%

Crown Damper.....40%

Excelsior.....40&10

Dividers—
See Compasses.**Dog Collars—**

Embossed, Gilt, Pope & Steven's list.....30&10

Leather, Pope & Steven's list.....40%

Brass, Pope & Steven's list.....40%

Door Springs—

Torrey's Rod, regular size.....\$ dos \$1.30

Gray's.....\$ gr, \$20.00, dis 20%

Bee Rod.....\$ gr, \$30.00, dis 20%

Warner's No. 1, \$ dos, \$2.50; No. 2, \$3.50; dis 40&10&50

Gem (Coll), list April 19, 1888.....10%

Star (Coll), list April 19, 1888.....20%

Victor (Coll).....60&60&10

Champion (Coll).....60&10&60&10&10

Philadelphia.....5 in., \$5.00; 8 in., \$7.75; dis 35%

Cowell's.....No. 1, \$ dos, \$18.00; No. 2, \$15.00; dis 50%

Rubber, complete.....\$ dos, \$4.50; dis 50%

Hercules.....65&10

Shaw Door Check and Spring.....25&30&35%

Drawing Knives—

P. S. & W.....75&50

Mix.....75&10

New Haven and Middlesex.....60&10&10

Merrill.....60&10&10

Witherby and Douglas.....75&75&50

Watrous.....15&10&25

L. & I. J. White.....20&25

Bradley's.....35%

Adjustable Handle.....25&33&45

Wilkinson's Folding.....25&25&50

Drills and Drill Stocks—

Blacksmith's.....each \$1.75

Blacksmith's Self-Feeding.....each \$7.50, dis 20%

Breast, P. S. & W.....40&10

Breast, Wilson's.....30&50

Breast, Miller's.....each \$3.00, dis 25%

Breast, Bartholomew's.....each \$2.50, dis 25%

Ratchet, Merrill's.....20&20&50

Ratchet, Ingersoll's.....25%

Ratchet, Parker's.....20&20&50

Ratchet, Whitney's.....20&10

Ratchet, Weston's.....20&25

Ratchet, Moore's Triple Action.....25&30

Whitney's Hand Drill, Plain, \$11.00; Adjustable, \$12.00.....dis 20&10

Wilson's Drill Stocks.....10%

Automatic Boring Tools.....each \$1.75 to \$1.85

Twist Drills—

Morse.....50&10&50

Standard.....50&10&50

Syracuse.....50&10&50

Cleveland.....50&10&50

Williams.....50&10&10

Drill Bits.—See Augers and Bits.**Drill Chucks.—See Chucks.****Dripping Pans—**

Small sizes.....\$ b 6¢

Large sizes.....\$ b 6 1/2¢

Egg Beaters.

Dover.....\$ dos \$2.00

National.....\$ dos \$4.50, dis 33&45

Family (T. & S. Mfg. Co.).....\$ gro \$17.00

Duplex (Standard Co.).....\$ gro \$15.00

Rival (Standard Co.).....\$ gro \$12.00

Triumph (T. & S. Mfg. Co.).....\$ gro \$10.50

Advance, No. 1.....\$ gro \$10.50

Advance, No. 2.....\$ gro \$10.00

Bryant's.....\$ gro \$15.00

Ayres' Spiral.....\$ gro \$5.00

Double (Hamblin & Russell Mfg. Co.).....\$ gro \$16.20

Easy (Hamblin & Russell Mfg. Co.).....\$ gro \$14.00

Triple (Hamblin & Russell Mfg. Co.).....\$ gro \$16.20

Spiral (Hamblin & Russell Mfg. Co.).....\$ gro \$4.50

Paine, Diehl & Co.'s.....\$ gro \$24.00

Egg Poachers—

Buffalo Steam Egg Poachers, \$ dos, No. 1, \$6.00; No. 2, \$9.00.....dis 25%

Electric Bell Sets.—

Wollensak's.....20%

Bigelow & Dowse.....20%

Emery—No. 4 to No. 54 to Flour, CF

46 gr. 150 gr. F F F.

Kegs, \$ b 4 1/4¢ 5 1/4¢ 2 1/4¢

1/4 kegs, \$ b 4 1/4¢ 5 1/4¢ 2 1/4¢

1/2 kegs, \$ b 4 1/4¢ 5 1/4¢ 2 1/4¢

10-bags, less than 10.....10¢ 10¢ 7 1/2¢

Enameled and Tinned Ware—
See Hollow Ware.**Escutcheon Pins—**

Iron, list Nov. 11, 1888.....50&10&50&10&50

Brass.....60&60&50

Escutcheons.

Door Lock.....Same dis as Door Locks.

Brass Thread.....60&60&10

Wood.....25%

Faucets.—

Fenn's.....40%

Bohren's Pat. Rubber Ball.....25%

Fenn's Cork Stops.....33&45

Star.....60%

Fratt's Pat. Petroleum.....40&50&25

West's Pat. Key.....50&10

Anchor Lock.....45%

Metallic Key, Leather Lined.....60&10

Cork Lined.....70&50&70&10

Burnside's Red Cedar.....50%

Burnside's Red Cedar, bbl lots.....50&10

John Sommers'.....

Peerless Best Block Tin Key.....40%

IXL, 1st quality, Cork Lined.....50%

Diamond Lock.....40%

Perfection, Fla. Red Cedar.....50%

Goodenough Cedar.....50%

Boss Metallic Key.....50%

Reliable Cork Lined.....50%

Western Pattern Cork Lined.....50%

Self-Measuring Enterprise, \$ dos \$50.00, dis 20&10

Cross-Cut Saw Handles—
 Atkins' No. 1 Loop, pair, 30¢; No. 3, 22¢; No. 2 and No. 4 Reversible, 22¢.
 Boynton's Loop Saw Handles, 50¢, dis 90¢
 Champion, 15¢

Hangers—
 Barn Door, old patterns, 60¢10¢10¢70¢
 Barn Door, New England, 60¢10¢10¢70¢
 Samson Steel Anti-Friction, 55¢
 Orleans Steel, 55¢
 Hamilton Wrought Wood Track, 55¢
 U. S. Wood Track, 55¢
 Champion, 60¢10¢
 Rider and Wooster, Medina Mfg. Co.'s
 List.
 Climax Anti-Friction, 70¢
 Climax Steel Anti-Friction, 70¢
 Zenith for Wood Track, 55¢
 Reed's Steel Arm, 50¢
 Challenge, Barn Door, 50¢
 Sterling's Improved (Anti-Friction), 65¢10¢
 Victor, No. 1, \$15.00; No. 2, \$16.50; No. 3, \$18.00, dis 50¢25¢
 Chertree, 50¢10¢60¢
 Kidder's, 50¢10¢60¢
 The "Boss", 90¢
 Best Anti-Friction, 80¢
 Duplex (Wood Track), 80¢
 Terry's Pat., pair, 4 in, \$10.00; 5 in, \$12.00, dis 50¢25¢
 Cronk's Pat., No. 4, \$12.00; No. 5, \$14.40; No. 6, \$18.00, dis 50¢15¢60¢
 Wood Track Iron Clad, pair, 10¢, dis 50¢
 Carrier Steel Anti-Friction, 50¢50¢25¢
 Architect, pair, set \$6.00, dis 50¢
 Eclipse, pair, set \$4.50, dis 20¢
 Richards, pair, set \$3.00, dis 10¢
 Lane's Steel Anti-Friction, 40¢10¢
 Ball Bearing Door Hanger, 20¢10¢25¢10¢
 Warner's Pat., 30¢20¢10¢
 Stearns' Anti-Friction, 20¢20¢10¢
 Stearns' Challenge, 25¢10¢20¢10¢
 Faultless, 40¢40¢10¢
 American, pair, set \$6.00, dis 20¢10¢
 Rider & Wooster, No. 1, 62¢4¢; No. 2, 75¢, dis 40¢
 Paragon, Nos. 1, 2 and 3, 40¢10¢
 Paragon, Nos. 5, 5½, 7 and 8, 20¢10¢
 Crescent, 60¢60¢10¢
 Nickel, Cast Iron, 20¢10¢
 Nickel, Malleable Iron and Steel, 40¢
 Scranton Anti-Friction Single Strap, 35¢4¢
 Scranton Anti-Friction Double Strap, 40¢
 Universal Anti-Friction, 40¢
 Wild West, 4 in. Wheel, \$15.00; 5 in. Wheel, \$21.00, dis 45¢
 Star, 40¢10¢40¢10¢5¢
 May, 50¢40¢50¢10¢
 Barry, \$6.00, dis 40¢10¢

Harness Snaps—
 See Snaps.

Hatchets—
 List Jan. 1, 1886, 35¢40¢
 Isaiah Blood, 40¢5¢
 Hunt's Shingling, Lath and Claw, 40¢5¢
 Hunt's Broad, 40¢10¢50¢
 Buffalo Hammer Co., 40¢10¢50¢
 Hurd's, 40¢10¢50¢
 Fayette R. Plumb, 40¢10¢50¢
 Wm. Mann, Jr., & Co., 50¢50¢50¢
 Underhill Edge Tool Co., 40¢10¢40¢10¢
 Underhill's, Haines and Bright, 35¢4¢
 C. Hammond & Son, 40¢10¢50¢
 Simmons', 40¢10¢50¢
 Peck's, 40¢10¢40¢10¢5¢
 Kelly's, 50¢50¢50¢
 Sargent & Co., 50¢
 Ten Eyck Edge Tool Co., 40¢10¢40¢10¢5¢
 Collins, following list, 10¢
 Shingling, Nos. 1, 2, 3, pair, set \$5.50, \$6.00, \$6.50
 Claw, Nos. 1, 2, 3, pair, set \$6.00, \$6.50, \$7.00
 Lathing, Nos. 1, 2, 3, pair, set \$5.50, \$6.00, \$6.50

Hay and Straw Knives—
 Lightning, Mfrs. price pair \$18.00, dis 25¢
 Jobbers' Extras.
 Electric, pair, set \$17, dis 30¢30¢5¢
 Gem, pair, set \$10, dis 30¢30¢5¢
 Wadsworth's, 40¢7½¢40¢10¢
 Carter's Needle, pair, set \$11.50, dis 10¢
 Heath's, pair, set \$13.50, dis 14¢
 Auburn Hay, Common and Spear Point, 50¢
 Auburn, Straw, 40¢

Hinges—
Wrought Iron Hinges
 Strap and T, 75¢75¢5¢
 Screw Hook and (6 to 12 in., pair, 3½¢
 Strap, 22 to 36 in., pair, 3½¢
 Heavy Welded (6 to 12 in., pair, 3½¢
 Hook, 22 to 36 in., pair, 3½¢
 Screw Hook (¾ in., pair, set \$1.50, dis 10¢
 and Eye (¾ in., pair, set \$3.50, dis 10¢
 Rolled Blind Hinges, Nos. 32 and 34, 60¢10¢
 Rolled Blind Hinges, Nos. 232 and 234, 55¢10¢
 Rolled Plate, 70¢10¢
 Rolled Raised, 70¢10¢
 Plate Hinges 8, 10 & 12 in., pair, 5¢
 "Providence" (over 12 in., pair, 4¢

Spring Hinges—
 Geer's Spring and Blank Butts, 40¢
 Union Spring Hinge Co.'s list, March, 1888, 30¢
 Acme and U. S., 30¢
 Empire and Crown, 20¢
 Hero and Monarch, 50¢
 American, Gem, and Star, Japanized, 20¢
 American, Gem, and Star, Bronzed, net
 Oxford, Bronze and Brass, net
 Barker's Double Acting, 30¢10¢
 Union Mfg. Co., 30¢
 Bonner's, 30¢
 Buckman's, 15¢20¢
 Chicago, 30¢
 Wiles, 10¢
 Devore's, 40¢
 Rex, 40¢

Gate Hinges—
 Western, pair, set \$4.40, dis 60¢
 E. E. Reversible, pair, set \$7.00, dis 55¢
 N. E. Reversible, pair, set \$5.50, dis 55¢10¢
 Clark's, Nos. 1, 2, 3, 60¢10¢5¢
 N. Y. State, pair, set \$5.00, dis 55¢10¢
 Automatic, pair, set \$15.50, dis 50¢

Common Sense, pair, set \$4.50, dis 50¢
 Seymour's, 45¢10¢
 Shepard's, 60¢10¢5¢
 Reed's Latch and Hinges, pair, set \$12.00, dis 60¢

Blind Hinges—
 Parker, 75¢23¢
 Palmer, 50¢5¢10¢
 Seymour, 70¢23¢
 Nicholson, 45¢10¢
 Huffer, 50¢
 Clark's, Nos. 1, 3, 5, 40 and 50, 75¢10¢5¢80¢
 Sargent's, Nos. 1, 3, 5, 11, 13, 75¢10¢75¢10¢5¢
 Sargent's, No. 12, 75¢10¢10¢
 Reading's Gravity, 75¢10¢75¢10¢5¢
 Shepard's Noiseless Niagara Buffalo, 75¢10¢75¢10¢5¢
 Champion, Steamboat, Clark's Old Pattern and Clark's Tip Pattern, 75¢10¢5¢
 Shepard's O. S., Lull & Porter, 75¢10¢
 Shepard's Acme, Lull & Porter, 75¢10¢
 Shepard's Queen City Reversible, 75¢
 Clark's Lull & Porter, Nos. 0, 1, 1½, 2, 3½, 3, 75¢10¢2½¢
 North's Automatic Blind Fixtures, No. 2, for Wood, \$10.50; No. 3, for Brick, \$13.50, dis 25¢23¢

Hoes—
Handled—
 Garden, Mortar, &c., 65¢
 Planter's Cotton, &c., 65¢
 Warren Hoe, 60¢
 Magic, pair, set \$4.00
Eye—
 D. & H. Scovill, 20¢
 Lane's Crescent Planter's Pattern, 45¢25¢
 Lane's Razor Blade, Scovill Pattern, 30¢
 Maynard, S. & O. Pat., 45¢25¢
 Sandusky Tool Co., S. & O. Pat., 60¢
 Hubbard & Co., S. & O. Pat., 60¢
 Chattanooga Tool Co., S. & O. Pat., 60¢
 Grub, 60¢60¢10¢

Hog Rings and Ringers—
 Hill's Improved Ringers, pair, set \$4.50
 Hill's Old Style Ringers, pair, set \$3.00
 Hill's Tongue, pair, set \$4.50
 Hill's Rings, pair, set \$2.50, dis 25¢40¢
 Perfect Rings, pair, set \$1.75, dis 20¢
 Perfect Ringers, pair, set \$2.50
 Blair's Hog Ringers, pair, set \$2.60, dis 25¢
 Blair's Hog Ringers, pair, set \$2.00, dis 25¢
 Champion Ringers, Double, pair, set \$2.25
 Champion Ringers, pair, set \$2.00
 Brown's Ringers, pair, set \$1.25, dis 1.30

Hoisting Apparatus—
 "Moore's" Hand Hoist, with Lock Brake, 20¢
 "Moore's" Differential Pulley Block, 40¢
 Energy Mfg. Co.'s, 25¢

Holders, File and Tool—
 Balz Pat., pair, set \$4.00, dis 25¢
 Nicholson File Holders, 20¢

Hollow-Ware—
Iron—
 Stove Hollow-Ware, Ground, 60¢25¢60¢10¢
 Stove Hollow-Ware, Unground, 60¢10¢10¢70¢
 Enameled and Tinned Hollow-Ware—
 Kettles, 70¢70¢5¢
 Oval Boilers, Saccapans and Glue Pots, 40¢40¢5¢
 Gray Enameled Ware, 50¢10¢50¢10¢5¢
 Agate and Granite Ware, 25¢
 Rustless Hollow-Ware, 50¢50¢5¢
 Galvanized Tea-Kettles—
 Inch 6 7 8 9
 Each, 55¢ 60¢ 65¢ 75¢
 Silver Plated—
 4 mo. or 5 ¢ cash in 30 days.

Reed & Barton, 40¢5¢
 Meriden Britannia Co., 40¢5¢
 Simpson, Hall, Miller & Co., 40¢5¢
 Rogers & Brother, 40¢5¢
 Hartford Silver Plate Co., 40¢5¢
 William Rogers Mfg. Co., 40¢5¢

Hooks—
Cast Iron—
 Bird Cage, Sargent's list, 60¢10¢10¢
 Bird Cage, Reading, 60¢10¢10¢
 Clothes Line, Sargent's list, 60¢10¢60¢10¢10¢
 Clothes Line, Reading list, 60¢10¢60¢10¢10¢
 Ceiling, Sargent's list, 55¢10¢10¢
 Harness, Reading list, 55¢10¢55¢10¢10¢
 Coat and Hat, Sargent's list, 55¢10¢55¢10¢10¢
 Coat and Hat, Reading, 50¢10¢50¢10¢10¢

Wrought Iron—
 Cotton, pair, set \$1.25
 Cotton Pat. (N. Y. Mallet & Handle Wks.), 30¢
 Tassel and Picture (T. & S. Mfg. Co.), 50¢
 Wrought Staples, Hooks, &c., See Wrought Goods.

Wire—
 Wire Coat and Hat, Gem, list April, 1888, 45¢
 Wire Coat and Hat, Miles', list April, 1888, 45¢
 Indestructible Coat and Hat, 45¢
 Wire Coat and Hat, Standard, 45¢
 Belt, 75¢10¢80¢

Miscellaneous.
 Grass, No. 2, \$2.00; No. 3, \$2.25; No. 4, \$2.50
 Bush, 55¢60¢
 Whitetree—Patent, 55¢
 Hooks and Eyes—Malleable Iron, 70¢70¢10¢
 Hooks and Eyes—Brass, 60¢10¢10¢
 Fish Hooks, American, 50¢
 Bench Hooks, See Bench Stops.

Horse Nails—
 Nos. 6 7 8 9 10
 Ausable, 28¢ 20¢ 25¢ 24¢ 23¢
 Clinton, Fin., 24¢ 22¢ 21¢ 20¢ 19¢
 Essex, 28¢ 20¢ 25¢ 24¢ 23¢
 Fish Hooks, American, 50¢
 Lyra, 25¢ 23¢ 22¢ 21¢ 20¢
 Snowden, 25¢ 23¢ 22¢ 21¢ 20¢
 Putnam, 23¢ 21¢ 20¢ 19¢ 18¢
 Vulcan, 23¢ 21¢ 20¢ 19¢ 18¢, dis 15¢
 Northwest, 25¢ 23¢ 22¢ 21¢ 20¢
 Globe, 23¢ 21¢ 20¢ 19¢ 18¢, dis 12¢25¢5¢

A. C., 25¢ 23¢ 22¢ 21¢ 20¢
 C. B. K., 25¢ 23¢ 22¢ 21¢ 20¢
 Champlain, 23¢ 20¢ 25¢ 24¢ 23¢, dis 35¢10¢10¢
 New Haven, 23¢ 20¢ 25¢ 24¢ 23¢, dis 35¢10¢25¢10¢10¢
 Saranac, 23¢ 21¢ 20¢ 19¢ 18¢, dis 30¢10¢
 Champion, 25¢ 23¢ 22¢ 21¢ 20¢, dis 10¢10¢10¢
 Capewell, 23¢ 20¢ 25¢ 24¢ 23¢, dis 35¢5¢35¢10¢
 Star, 23¢ 21¢ 20¢ 19¢ 18¢, dis 10¢10¢10¢12¢4¢
 Anchor, 23¢ 21¢ 20¢ 19¢ 18¢, dis 35¢
 Western, 23¢ 21¢ 20¢ 19¢ 18¢, dis 40¢10¢
 Empire Bronzed, 14 ¢ B.

Horse Shoes—See Shoes Horse.
Hose, Rubber—
 Competition, 75¢10¢75¢10¢5¢
 Standard, 70¢70¢10¢
 Extra, 60¢60¢10¢
 N. Y. B. & P. Co. Para., 30¢10¢
 N. Y. B. & P. Co. Extra, 50¢
 N. Y. B. & P. Co. Dundee, 60¢10¢5¢

Huskies—
 Blair's Adjustable, pair, set \$8.00
 Blair's Adjustable Clipper, pair, set \$7.00

Jack Screws—See Screws.
Kettles—
 Spun, Stamped.
 Brass, 7 to 17 in., pair, 24¢ 21 ¢
 Brass larger than 17 in., pair, 26¢ 23¢4¢
 Enameled and Tea Kettles, See Hollow-Ware.

Keys—
 Lock Ass'n list Dec. 30, 1886, 50¢10¢
 Eagle Cabinet, &c., 33¢4¢2¢
 Hotchkiss' Brass Blanks, 33¢4¢2¢
 Hotchkiss' Copper and Tinned, 40¢
 Hotchkiss' Pad and Cab., 35¢
 Hotchkiss' Bed Keys, pair, set \$4.00, dis 15¢
 Wollensack Tinned, 50¢10¢

Knife Sharpeners—
 Pardin's Applewood Handles, pair, set \$6.00, dis 40¢
 Pardin's Rosewood or Coccololo, pair, set \$9.00, dis 40¢

Knives—
 Wilson's Butcher Knives, 25¢30¢
 Ames' Butcher Knives, 25¢
 Foster Bros' Butcher, &c., 40¢
 Nichols' Butcher Knives, 40¢10¢
 Ames' Shoe Knives, 40¢10¢
 Ames' Bread Knives, pair, set \$1.50, dis 15¢20¢
 Moran's Shoe and Bread, 20¢
 Hay and Straw, See Hay Knives.
 Table and Pocket, See Cutlery.
 Corn, Auburn Mfg. Co. Western Pat., \$2.00
 Corn, Auburn Mfg. Co. Crescent, \$3.50

Knobs—
 Door Mineral, 65¢68¢
 Door Por. Jap'd, 75¢78¢
 Door Por. Nickel, \$2.00, dis 25¢
 Door Por. Plated, Nickel, \$2.00, dis 25¢
 Drawer, Porcelain, 60¢10¢60¢10¢10¢
 Hemacite Door Knobs, 40¢10¢40¢
 Yale & Towne Wood, list Dec. 1888, 40¢
 Furniture, Plain, 75¢ gro 10¢, dis 10¢
 Furniture, Wood Screws, 25¢10¢
 Base, Rubber Tip, 70¢10¢5¢
 Picture, Judd's, 60¢10¢10¢70¢
 Picture, Sargent's, 70¢10¢
 Picture, Hemacite, 35¢5¢
 Shutter, Porcelain, 65¢10¢
 Carriage, Jap., pair, set \$3.00, dis 60¢10¢

Lades—
 Melting, Sargent's, 55¢10¢
 Melting, Reading, 35¢10¢
 Melting, Monroe's Pat., pair, set \$4.00, dis 40¢
 Melting, P. S. & W., 35¢10¢40¢
 Melting, Warner's, 30¢

Lawn Mowers—
 Standard List, 50¢10¢
 Enterprise, 60¢10¢

Lanterns—
Tubular
 Plain with Guards, pair, set \$4.00, dis 4.25
 Lift Wire, with Guards, pair, set \$4.50, dis 4.75
 Square Plain, with Guards, pair, set \$4.00, dis 4.25
 Sq. Lift Wire, with Guards, pair, set \$4.25, dis 4.50
 Without Guards, 25¢ pair less.

Miscellaneous.
 Police, Small, \$6.00; Medium, \$7.25;
 Large, \$9.75, dis 20¢25¢

Lemon Squeezers—
 Porcelain Lined, No. 1, pair, set \$6.00, dis 25¢30¢
 Wood, No. 2, pair, set \$3.00, dis 35¢
 Wood, Common, pair, set \$1.70, dis 1.75
 Dunlap's Improved, pair, set \$3.75, dis 20¢
 Sammis, No. 1, \$5.00; No. 2, \$3.00; No. 3, \$1.80, dis 25¢10¢
 Jennings' "Star", pair, set \$2.50, dis 25¢
 The "Boss", pair, set \$2.50, dis 25¢
 Dean's, No. 1, pair, set \$6.50; No. 2, \$3.35; No. 3, \$1.90
 Little Giant, 50¢50¢5¢
 King, 40¢5¢

Lines—
 Cotton and Linen Flab, Draper's, 50¢
 Draper's Chalk, 60¢
 Draper's Mason's Linen, 84 ft., No. 1, \$1.25; No. 2, \$1.75; No. 3, \$2.25; No. 4, \$2.75; No. 5, \$3.25, dis 25¢
 Cotton Chalk, 65¢
 Samson, Cotton, No. 4, \$2; No. 4½, \$2.50, dis 10¢
 Silver Lake, Braided, No. 0, \$6.00; No. 1, \$6.50; No. 2, \$7.00; No. 3, \$7.50, dis 25¢
 Mason's Linen, No. 3½, \$1.50; No. 4, \$2.00; No. 4½, \$2.50.
 Mason's Colored Cotton, No. 18, \$3.00; No. 19, \$3.50; No. 20, \$4.00, dis 20¢
 Ventilator Cord, Samson Braided, White or Drab Cot., pair, set \$7.50, dis 20¢

Locks, &c.—
 Door Locks, Latches, &c., List Dec. 30, '86, chgd Feb. 2, '87, dis 50¢10¢60¢5¢
 Mallory, Wheeler & Co., list July, '88, 50¢10¢60¢
 Sargent & Co., list Aug. 1, '88, 55¢22¢
 Reading Hardware Co., list Feb. 2, '88, 55¢60¢10¢
 Livingston & Co., Note—Lower net prices often made.
 Perkins' Burglar Proof, 60¢25¢
 Plate, 38¢42¢
 F. Many's "Extension Cylinder" \$10.50
 Barnes Mfg. Co., 40¢40¢10¢
 Yale Corrugated Key, 33¢14¢
 Deitz Flat Key, 30¢
 L. & C. Round Key Latches, 30¢10¢
 L. & C. Flat Key Latches, 33¢10¢10¢
 Romer's Night Latches, 15¢
 Yale, new list, 35¢4¢
 "Shepardson" "U. S.", 40¢10¢
 "Felder" or "American", 40¢10¢
 Seed's N. Y. Hasp Lock, 25¢

Cabinets—
 Eagle, Gaylord Par., list March, '84, rev. ker and Corbin, Jan. 1, '85, 33¢42¢
 Deitz, Nos. 36 to 39, 40¢
 Deitz, Nos. 51 to 63, 40¢10¢
 Deitz, Nos. 86 to 96, 30¢
 Stoddard Lock Co., 30¢33¢4¢
 "Champion" Night Latches, 40¢10¢
 Barnes Mfg. Co., 40¢40¢10¢
 Eagle and Corbin Trunk, 25¢2¢
 "Champion" Cab. and Combin., 33¢4¢
 Yale, 33 ¢
 Romer's, 25¢

Padlocks—
 List Dec. 23, '84, 75¢75¢10¢
 Yale Lock Mfg. Co.'s, 33¢4¢
 Eagle, 25¢2¢
 Eureka, Eagle Lock Co., 40¢10¢
 Romer's, Nos. 0 to 91, 30¢
 Romer's Scandinavian, &c., Nos. 100 to 506, 15¢
 A. E. Deitz, 40¢
 "Champion" Padlocks, 40¢
 Hotchkiss, 30¢
 "Star", 45¢
 "Horseshoe", pair, set \$8.00, dis 40¢10¢10¢
 Barnes Mfg. Co., 40¢40¢10¢
 No. 1's, 30¢
 Brown's Pat., 25¢
 Scandinavian, 10¢10¢10¢
 Fraim's Pat. Scandinavian, low list, 60¢
 Ames Sword Co. up to No. 150, 40¢
 Ames Sword Co. above No. 150, 50¢

Lumber Tools.
 Ring Peavies, "Blue Line" Finish, pair, set \$2.00
 Ring Peavies, Common Finish, pair, set \$1.80
 Steel Socket Peavies, pair, set \$2.00
 Mall. Iron Socket Peavies, pair, set \$1.90
 Cant Hooks, "Blue Line" Finish, per doz, \$16.00
 Cant Hooks, Common Finish, per doz, \$14.00
 Cant Hooks, Mall. Socket Clasp, "Blue Line" Finish, per doz, \$16.00
 Cant Hooks, Mall. Socket Clasp, Common Finish, per doz, \$14.50
 Cant Hooks, Clip Clasp, "Blue Line" Finish, per doz, \$14.00
 Cant Hooks, Clip Clasp, Common Finish, per doz, \$12.00
 Hand Spikes, pair, set 6 ft., 15.00; 8 ft., 20.00
 Pike Poles, Pike & Hook, pair, set 12 ft., \$11.50; 14 ft., \$12.50; 16 ft., \$14.50; 18 ft., \$17.50; 20 ft., \$21.50.
 Pike Poles, Pike only, pair, set 12 ft., \$10.00; 14 ft., \$11.00; 16 ft., \$13.00; 18 ft., \$16.00; 20 ft., \$20.00.
 Pike Poles, not ironed, pair, set 12 ft., \$6.00; 14 ft., \$7.00; 16 ft., \$8.00; 18 ft., \$12.00; 20 ft., \$16.00.
 Setting Poles, pair, set 12 ft., \$14.00; 14 ft., \$15.00; 16 ft., \$17.00.
 Swamp Hooks, pair, set \$18.00

Lustro—
 Four-ounce Bottles, pair, set \$1.75, pair, gross, \$17.00

Mallets—
 Hickory, 20¢10¢20¢10¢10¢
 Lignumvite, 20¢10¢20¢10¢10¢
 B. & L. Block Co., Hickory & L. V., 30¢30¢10¢

Match Safes—
 Dangerfield's Self-igniting, pair, set \$1.50.
 Mattocks, Regular list 50¢10¢60¢10¢5¢

Meat Cutters—
 Dixon's pair, set \$2.00
 Nos. 1 2 3 4
 \$14.00 \$17.00 \$19.00 \$30.00, dis 40¢5¢
 Woodruff's pair, set \$2.00
 Nos. 100 150
 \$15.00 \$18.00, dis 40¢5¢

Champion pair, set \$2.00
 Nos. 200 300 400
 \$22.00 \$27.00 \$40.00, dis 40¢45¢
 Hales Pattern pair, set \$2.00
 Nos. 11 12 13
 \$27.00 \$33.00 \$45.00, dis 70¢70¢5¢
 American, Nos. 1 2 3 4B
 Each, \$5 \$7 \$10 \$25 \$50 \$60
 Enterprise, 30¢
 Nos. 10 12 22 32 42
 Each, \$3 \$2.50 \$4 \$6 \$15
 Pennsylvania, Nos. 2 3 4
 \$2.00 \$2.40 \$2.80 \$3.60 \$28.00

Miles' Challenge pair, set \$2.00
 Nos. 1 2 3
 \$22.00 \$30.00 \$40.00, dis 45¢45¢10¢
 Home No. 1, pair, set \$26.00, dis 55¢10¢
 Draw Cut, each:
 Nos. 5 6 8
 \$50 \$75 \$80 \$225, dis 20¢25¢
 Beef Shavers (Enterprise), 20¢10¢30¢
 Chadborn's Smoked Beef Cutter, pair, set \$68.00

Mincing Knives—
 Am. (2d quality), pair, set \$7.00; 2 blades, \$12; 3 blades, \$18, net
 Lathrop's, pair, set \$10.00; 2 blades, \$10
 Smith's, pair, set \$10.00; Double, \$3
 Knapp & Cowles, 50¢10¢60¢
 Buffalo Adjustable, pair, set \$3.00, dis 25¢

Molasses Gates—				
Stebbin's Pat.	70¢	70¢	70¢	70¢
Stebbin's Genuine	60¢	60¢	60¢	60¢
Stebbin's Tinned Ends	40¢	40¢	40¢	40¢
Chase's Hard Metal	50¢	50¢	50¢	50¢
Bush's	20¢	20¢	20¢	20¢
Lincoln's Pattern	70¢	70¢	70¢	70¢
Weed's	20¢	20¢	20¢	20¢
Boss, 7 doz.	1	2	3	4
No. 1	\$7	\$8	\$9	\$10
No. 2	\$10	\$10	\$10	\$10
Money Drawers—				
Muzzles—				
Safety	7 doz.	\$3.00	dis 25%	
Nails, see Trade Report.				
Wire Nails & Brads, list July 14, '87				
Wire Nails, Standard Penny				
Nail Puller—				
Curtiss Hammer	7 doz	\$9	net	
Giant, No. 1	7 doz	\$30.00	10%	
Pellcan	7 doz	\$5.00	dis 25%	
Boss	7 doz	\$3.00	dis 30%	
Lightning	7 doz	\$2.00		
Nail Sets—				
Square	7 gr.	\$4.00	\$4.25	
Round	7 gr.	\$3.25		
Cannon's Diamond Point	7 gr.	\$12.20		
Nut Crackers—				
Table (H. & B. Mfg. Co.)				
Blake's Pattern	7 doz	\$2.00	dis 10%	
Turner & Seymour Mfg. Co.				
Nuts—				
Nuts, off list Jan. 1, 1888: Square. Hex.				
Hot Pressed	5.4¢	5.9¢		
Cold Punched	5.4¢	5.5¢		
In lots less than 100 lb.	7 lb.	add 1¢	1-b	
boxes, add 1¢ to list.				
Oakum—				
Government	7 lb	73¢	8¢	
U. S. Navy	7 lb	64¢	6¢	
Navy	7 lb	53¢	5¢	
Oilers—				
Zinc and Tin				
Brass and Copper				
Malleable, Hammers, Improved, No. 1				
\$3.00; No. 2, \$1.40; No. 3, \$1.40				
Malleable, Hammers, Old Pattern, same				
list				
Prior's Pat. or "Paragon" Zinc				
Prior's Pat. or "Paragon" Brass				
Olmstead's Tin and Zinc				
Olmstead's Brass and Copper				
Broughton's Zinc				
Broughton's Brass				
Packing, Steam—				
Standard	60¢	10¢	60¢	10¢
Extra	50¢	10¢	50¢	10¢
N. Y. B. & P. Co., Standard	50¢	10¢	50¢	10¢
N. Y. B. & P. Co., Empire	70¢			
N. Y. B. & P. Co., Salamander				
Jenkins' Standard	65¢	10¢	65¢	10¢
	80¢	10¢	80¢	10¢
Miscellaneous—				
American Packing	10¢	11¢	10¢	11¢
Russia Packing	14¢	11¢	14¢	11¢
Italian Packing	13¢	11¢	13¢	11¢
Cotton Packing	15¢	17¢	15¢	17¢
Jute	7¢	6¢	7¢	6¢
Padlocks—				
See Locks.				
Pails—				
Galvanized Iron—				
Quarts	10	12	14	
Hill's Light Weight	7 doz.	\$2.75	3.00	3.25
Hill's Heavy Weight	7 doz.	3.40	3.75	
Whiting's	2.75	3.00	3.25	
Sidney Shephard & Co.	2.80	3.00	3.40	
Iron Clad	2.75	3.00	3.25	
Fire Buckets	2.75	3.25	3.50	
Buckets, see Well Buckets.				
Indurated Fibre Ware—				
Star Pails, 12 qt.	7 doz	\$4.50		
Fire, Stable and Milk, 14 qt.	7 doz	\$5.50		
Pencils—				
Faber's Carpenters'				
Faber's Round Gilt				
Dixon's Lead				
Dixon's Lumber				
Dixon's Carpenters'				
Picks—				
Railroad or Adze Eye, 5 to 6, \$12.00; 6				
to 7, \$13.00				
Picture Nails—				
Brass Head, Sargent's list	50¢	10¢	50¢	10¢
Brass Head, Combination list	50¢	10¢	50¢	10¢
Porcelain Head, Sargent's list	50¢	10¢	50¢	10¢
Porcelain Head, Combination list	40¢	10¢	40¢	10¢
Niles' Patent				
Pinking Irons—				
Pipe, Wrought Iron—				
List March 23, 1887.				
1½ and under, Plain				
1½ and under, Galvanized				
1½ and over, Plain				
1½ and over, Galvanized				
Bolter Tubes, Iron				
Planes and Plane Irons—				
Wood Planes—				
Molding	50¢	50¢	50¢	50¢
Bench, First Quality	50¢	10¢	50¢	10¢
Bench, Second Quality	50¢	10¢	50¢	10¢
Bailey's (Stanley R. & L. Co.)	30¢	10¢	30¢	10¢
Iron Planes—				
Bailey's (Stanley R. & L. Co.)	40¢	10¢	40¢	10¢
Miscellaneous Planes (Stanley R. & L. Co.)	20¢	10¢	20¢	10¢
Victor Planes (Stanley R. & L. Co.)	20¢	10¢	20¢	10¢
Steer's Iron Planes	35¢	35¢	35¢	35¢
Meriden Mfg. Co.	30¢	10¢	30¢	10¢
Davis's Iron Planes	30¢	10¢	30¢	10¢
Birmingham Plane Co.	50¢	50¢	50¢	50¢
Gage Tool Co.'s Self-Setting	20¢	10¢	20¢	10¢
Chaplin's Iron Planes	40¢	10¢	40¢	10¢
Sargent's	30¢	10¢	30¢	10¢

Plane Irons—				
Plane Irons	30¢	10¢	30¢	10¢
Plane Irons, Butcher's	\$5.00	\$5.25	to 2	
Plane Irons, Buck Bros	30¢			
Plane Irons, Auburn Tool Co., "This-	40¢			
tle"				
Sandusky Tool Co.				
Single and Cut	80¢			
Double	40¢			
L. & I. J. White	25¢			
Pliers and Nippers—				
Button's Patent	30¢	10¢	30¢	10¢
Hall's No. 2, 5 in.	\$13.50	No. 4, 7 in.		
\$21.00 7 doz.		dis 20¢	10¢	
Humason & Beckley Mfg. Co.	50¢	50¢	10¢	
Gas Pliers	80¢			
Gas Pliers, Custer's Nickel Plated	60¢	55¢		
Eureka Pliers and Nippers	40¢			
Russell's Parallel	25¢			
P. S. & W. Cast Steel	50¢			
P. S. & W. Tinner's Cutting Nippers				
add 6¢ dis 10%				
Carew's Pat. Wire Cutters	80¢			
Morrill's Parallel	7 doz	\$12.00	30¢	
Cronk's 8 in.	\$15.00; 10 in.	\$21.00		
			40¢	40¢
Plumbs and Levels—				
Regular List	70¢	10¢	70¢	10¢
Diston's	45¢	10¢	45¢	10¢
Pocket Levels	70¢	10¢	70¢	10¢
Davis Iron Levels	30¢			
Davis' Inclometers	10¢	10¢		
Poppers, Corn—				
Round or Square, 1 qt.	7 gr	\$12.00	\$15.00	
Round or Square, 2 qt.	7 gr	\$25.00	\$28.00	
Post Hole and Tree Augers and Diggers—				
Samson Post Hole Digger	7 doz	\$36.00		
Fletcher Post Hole Augers	7 doz	\$36.00		
Eureka Diggers	7 doz	\$16.00	\$17.00	
Leed's	7 doz	\$8.00	\$9.00	
Vaughan's Post Hole Auger	7 doz			
Kohler's Little Giant		\$13.00	\$14.00	
Kohler's Hercules	7 doz	\$18.00		
Kohler's New Champion	7 doz	\$8.00		
Schneider	7 doz	\$18.00		
Ryan's Post Hole Diggers	7 doz	\$24.00		
Cronk's Post Bars	7 doz	\$90.00		
Gibb's Post Hole Digger	7 doz	\$50¢	\$50.10¢	
			dis 40¢	40¢
Potato Parers—				
White Mountain	7 doz	\$6.00	\$5.50	
Antrim Combination	7 doz	\$8.00		
Hoosier	7 doz	\$13.50		
Pruning Hooks and Shears—				
Diston's Combined Pruning Hook and				
Saw	7 doz	\$18.00	dis 20¢	10¢
Diston's Pruning Hook	7 doz	\$12.00		
E. S. Lee & Co.'s Pruning Tools				
Pruning Shears, Henry's Pat.	7 doz			
Henry's Pruning Shears	7 doz	\$4.25	4.50	net
Wheeler, M. & Co.'s Combination				
Dunlap's Saw and Chisel	7 doz	\$5.50	dis 30%	
J. Mallinson & Co., No. 1, \$5.25; No. 2, 7.25				
Pulleys—				
Hot House, Awning, &c.	60¢	10¢		
Japanned Screw	60¢	10¢		
Japanned Side	60¢	10¢		
Japanned Clothes Line	60¢	10¢		
Empire Sash Pulley	55¢	90¢		
Moore's Sash, Anti-Friction	50¢			
Hay Fork, Solid Eye, \$4.00; Swivel				
Hay Fork, "Anti-Friction," 5 in. Solid				
Hay Fork, "F" Common and Pat.				
Bushed	20¢			
Hay Fork, Tarbox Pat. Iron	20¢			
Hay Fork, Reed's Self-Lubricating	20¢			
Shade Rack	45¢			
Tackle Blocks	See Blocks			
Pumps—				
Clatrom, Best Makers	50¢	10¢	50¢	10¢
Pitcher Spout, Best Makers	60¢	10¢	60¢	10¢
Pitcher Spout, Cheaper Goods	70¢	10¢	70¢	10¢
Punches—				
Saddlers' or Drive, good quality	7 doz			
Bemis & Call Co.'s Cast Steel Drive	60¢	55¢		
Spring, good quality	7 doz	\$2.50	\$2.20	
Spring, Leach's Pat.	15¢			
Bemis & Call Co.'s Spring and Check	40¢			
Solid Tinner's	7 doz	\$1.44	dis 55%	
Tinner's Hollow Punches	20¢	25¢		
Rice Hand Punches	15¢			
Avery's Revolving	30¢	10¢		
Avery's Saw-Set and Punch. See Saw Sets.				
Rail—				
Sliding Door, Wrt Brass, 7 lb 35¢	dis 15%			
Sliding Door, Bronzed Wrt Iron	7 lb 7¢			
Sliding Door, Iron, Painted	7 lb 4¢			
Barn Door, Light In. ½	dis 20¢	10¢		
Per 100 feet	\$2.50	3.00	4.40	dis 10%
B. D. for N. E. Hangers				
Small. Med. Large.				
Per 100 feet	\$2.15	2.70	3.25	net
Terry's Wrought Iron	7 lb	4¢		
Victor Track Rail, 7 lb	7 lb	4¢		
Carrier Steel Rail	7 lb	4¢		
Rakes—				
Cast Steel, Association goods	65¢			
Cast Steel, outside goods	60¢	10¢	70¢	
Malleable	70¢	70¢		
Gibbs Lawn Rake	\$12.00	dis 50%		
Canton Lawn Rake	\$9.00	dis 50%		
Ft. Madison Prize Bow Rake and Peer-				
less	35¢			
Fort Madison Steel Tooth Lawn Rake	\$5.00			
Razors—				
J. R. Torrey Razor Co.	20¢			
Westenholme & Butcher	\$10.00	to 2		

Razor Straps—	
Genuine Emerson.....	60¢@0025
Imitation " " doz \$2.00, dis 20¢1025	
Torrey's.....	70¢
Badger's Belt and Com.....	7 doz \$2.00
Lamont Combination.....	7 doz \$4.00
Rivets and Burrs—	
Copper.....	50¢@50210
Iron, list Nov. 17, '87.....	50¢
Rivet Sets—	
dis 5022¢@50210	
Rods	
Stair, Brass.....	2522¢
Stair, Black Walnut.....	7 doz 40¢
Rollers—	
Barn Door, Sargent's list.....	60¢10210210
Acme (Anti-Friction).....	55¢
Union Barn Door Roller.....	70¢
Rope—	
Manufacturers' prices for large lots:	
Manila ¼ in. and larger 7 lb 14¢	for cash in
Manila ½ in. 7 lb 14¢	
Manila ¾ in. 7 lb 14¢	
Manila 1 in. 7 lb 14¢	
Manila Tarred Rope.....	7 lb 12¢
Manila Hay Rope.....	7 lb 14¢
Sisal ¼ in. and larger 7 lb 12¢	for cash in
Sisal ½ in. 7 lb 12¢	
Sisal ¾ in. 7 lb 12¢	
Sisal 1 in. 7 lb 12¢	
Sisal 1 ½ in. 7 lb 12¢	
Sisal, Hay Rope.....	7 lb 12¢
Sisal, Tarp.....	7 lb 12¢
Sisal, Medium Latho Yarn.....	7 lb 11¢
Cotton Rope.....	7 lb 15¢@18¢
Jute Rope.....	7 lb 7¢
Rules—	
Boxwood.....	80¢10¢@90¢10210
Ivory.....	50¢@50210
Stearns's Rules and Straight Edges.....	25¢10
Steel.....	25¢10
Sad Irons—	
From 4 to 10, at factory ... 7 100 lb.	
	\$2.40@22.50
Self-Heating.....	7 doz 90¢ net
Self-Heating, Tailors'.....	7 doz \$18.00 net
Gleason's Shield and Tollet.....	55¢
Mrs. Pott's Irons.....	40¢@4025
Enterprise Star Irons.....	40¢
Combined Fluter and Sad Iron, 7 doz.	
\$15.00.....	dis 15¢
Fox Reversible, Self-Fluter.....	7 doz \$24.00 net
Chinese Laundry (N. E. Butt Co.) 8 1/2	
New England.....	dis 15¢
Mahony's Troy Pol. Irons.....	25¢
Sensible.....	20¢@2025
National Self-Heating.....	dis 30¢
Hand and Emery Paper and Cloth—	
List April 19, 1886.....	35¢@40¢
Sibley's Emery and Crocus Cloth.....	30¢
Sash Cord—	
Common.....	7 lb 10¢@11¢
Patent, good quality.....	7 lb 12¢@13 1/2¢
White Cotton Braided, fair quality.....	7 lb 22¢@20¢
Common Russia Sash.....	7 lb 12¢
Patent.....	7 lb 12 1/2¢
Cable Laid Italian Sash.....	7 lb 22¢@23¢
India Cable Laid.....	7 lb 13¢
Silver Lake, A Quality, White, 50¢	
	dis 10¢1025
Silver Lake, A Quality, Drab, 55¢	
	dis 10¢1025
Silver Lake, B Quality, White, 50¢	
	dis 20¢1025
Silver Lake, B Quality, Drab, 55¢	
	dis 20¢1025
Silver Lake, C Quality, White (only).....	27¢@23 1/2¢
Sylvan Spring, Extra Braided, White, 34¢	
Sylvan Spring, Extra Braided, Drab, 35¢	
Semper Idem, Braided, White.....	30¢
Egyptian, India Hemp, Braided.....	25¢
Samson, Braided, White Cotton, 50¢	
	dis 30¢3025
Samson, Braided, Drab Cotton, 55¢	
	dis 30¢3025
Samson, Braided, Italian Hemp, 55¢	
	dis 30¢3025
Samson, Braided, Linen, 80¢	
	dis 30¢3025
Sash Locks—	
Clark's, No. 1, \$10.00; No. 2, \$8.00 7 gr.	
	dis 32 1/2¢
Ferguson's.....	55¢
Morris and Triumph, list Aug. 16, 1886.....	60¢25
Victor.....	60¢1025
Walker's.....	60¢
Attwell Mfg. Co.....	25¢33 1/2¢
Reading.....	60¢10¢@60¢10210
Hammond's Window Springs.....	40¢
Common Sense, Jap'd, Cop'd and Br'd.....	7 gr \$4.00
Common Sense, Nickel Plated.....	7 gr \$10.00
Universal.....	30¢
Kempshall's Gravity.....	80¢
Kempshall's Model.....	60¢@60102
Corbin's Daisy, list Feb. 15, 1886.....	70¢
Payson's Perfect.....	60¢@60102
Dixon's Sash Balances.....	55¢@55¢
Hughen's New Sash Locks.....	25¢@25¢
Stoddard "Practical".....	10¢
Ives' Patent.....	60¢@60102
Liesche's, Nos. 100 and 110, 7 gr 85	
106, \$10.00.....	dis 20¢102
Dixon's Bronze, Barnes Mfg. Co.....	50¢
Champion Safety, list March 1, 1884.....	55¢@55¢
Security.....	70¢
Sash Weights—	
Solid Eyes.....	7 ton \$22.00
Sash Stuffers or Fillers—	
Milas' "Challenge," 7 doz \$20.00.....	dis 50¢@5025
Perry..... 7 doz, No. 1, \$15.00 No. 0,	
\$21.00.....	dis 50¢@5025
Draw Cut No. 4, each \$30.00.....	dis 20¢
Enterprise Mfg. Co.....	20¢10¢@30¢
Silver's.....	40¢102
Saws—	
Disston's Circular.....	45¢@4525
Disston's Cross.....	Extras some times given by jobbers.
Cuts.....	45¢@4525
Disston's Circular.....	25¢@2525
Alking's Circular.....	50¢

Machine-	
Flat Head, Iron.....	55%
Round Head, Iron.....	50%
Bench and Hand-	
Bench, Iron.....	55% to 50% to 10%
Bench, Wood, Beech.....	50% to 25%
Bench, Wood, Hickory.....	20% to 10%
Hand, Wood.....	25% to 10% to 5%
Lag, Blunt Point.....	75% to 50%
Coch and Lag, Gimlet Point.....	25%
Bed.....	25%
Hand Rail, Sargent's.....	60% to 40%
Hand Rail, H. & B. Mfg. Co.....	70% to 40%
Hand Rail, Am. Screw Co.....	75%
Jack Screws, Millers Falls list.....	50% to 25%
Jack Screws, P. S. & W.....	35%
Jack Screws, Sargent's.....	60% to 40% to 10%
Jack Screws, Stearns.....	40% to 10%
Scroll Saws-	
Lester, complete, \$10.00.....	25%
Rogers, complete, \$4.00.....	25%
Barnes' Builders' and Cabinet Makers'.....	25%
\$15.....	25%
Barnes' Scroll Saw Blades.....	35%
Scythe Snaths-	
Shears.....	50% to 25%
American (Camp) Iron.....	
Pruning, See Pruning Hooks and Shears.....	
Barnard's Lamp Trimmers.....	50% to 25%
Timmers.....	50% to 25%
Seymour's, List, Dec. 1881.....	60% to 10% to 5%
Heinrich's, List, Dec. 1881.....	60% to 10% to 5%
Heinrich's Tailors' Shears.....	60% to 10% to 5%
First quality C. S. Trimmers.....	60% to 10% to 5%
Second quality C. S. Trimmers.....	60% to 10% to 5%
Acme Cast Shears.....	
Diamond Cast Shears.....	10%
Clipper.....	10%
Victor Cast Shears.....	75% to 10%
Howe Bros. & Hulbert, Solid Forged.....	40%
Steel.....	40%
Cleveland Machine Co., Solid Steel.....	70%
Forged.....	70%
Clauss Shear Co., Japanned.....	70%
Clauss Shear Co., Nickel, same list.....	60%
Sheaves-	
Sliding Door-	
N. W. & Co. List July, 1888.....	50% to 10% to 5%
R. & E. List Dec. 18, 1885.....	55% to 20%
Corbin's list.....	60% to 10% to 5%
Patent Roller.....	60% to 10% to 5%
Patent Roller, Hatfield's.....	75%
Russell's Anti-Friction, List Dec. 18, 1885.....	60% to 25%
Moore's Anti-Friction.....	60%
Sliding Shutter-	
R. & E. List Dec. 18, 1885.....	60% to 10% to 5%
Sargent's list.....	60% to 10%
Reading list.....	60% to 10% to 5%
Ship Tools-	
L. & I. J. White.....	30% to 5%
Albertson Mfg. Co.....	25%
Shoes, Horse, Mule, &c.-	
Horse-	
Burden's, Perkins', Phoenix, at factory.....	\$4.00
Mule-	
Add \$1 per keg to above prices.....	
Or, Wrought-	
Ton lots.....	75% to 25%
1000 lb lots.....	75% to 25%
500 lb lots.....	75% to 25%
Shot-	
(Eastern prices 25% off, cash, 5 days.)	
Drop, 7 bag, 25 lb.....	\$1.30
Drop, 7 bag, 5 lb.....	30
Buck and Chilled, 7 25-lb bag.....	1.45
Buck and Chilled, 7 5-lb bag.....	.34
Shovels and Spades-	
Ames' Shovels, Spades, &c., list Nov. 1, 1885.....	20%
NOTE.-Jobbers frequently give 5% to 7% extra on above.....	
Grimm's Black Iron.....	50% to 10%
Grimm's Solid C. S. R. Goods.....	60% to 10%
Old Colony (Sanford Fork & Tool Co.).....	20%
St. Louis Shovel Co.....	20% to 75%
Hussey, Binns & Co.....	15% to 25%
Hubbard & Co.....	30% to 20% to 75%
Lehigh Mfg. Co.....	50% to 10%
Payne Pettibone & Son, list January, 1886.....	30%
Remington's (Lowman's Patent).....	30% to 10% to 40%
Rowland's, Black Iron.....	50% to 10%
Rowland's Steel.....	60% to 50% to 10%
Shovels and Tongs-	
Iron Head.....	60% to 10% to 5%
Brass Head.....	60% to 10% to 5%
Skins, Thimble-	
Western list.....	75% to 50% to 10%
Columbus Wrt. Steel, list Nov. 1, 1887.....	50% to 10%
Coldbrookdale Iron Co.....	50% to 10%
Utica P. S. T. Skins.....	60%
Utica Turned and Fitted.....	35%
Staves-	
Buffalo Metallic, S. S. & Co., new list.....	50% to 25% to 10%
Barber Flour Sifters.....	50% to 25% to 10%
Smith's Adjustable Sifters.....	50% to 25% to 10%
Smith's Adjustable Milk Strainer.....	50% to 25% to 10%
Smith's Adjustable F. & C. Strainer.....	50% to 25% to 10%
Staves, Wooden Rim-	
Meah 15, Nested, 7 doz.....	70% 90%
Meah 20, Nested, 7 doz.....	85% 1.00
Meah 24, Nested, 7 doz.....	\$1.00 1.10
Staves-	
School, by case.....	50% to 10%
Snaps, Harness, &c.-	
Anchor (T. & S. Mfg. Co.).....	65%
Fitch's (Bristol).....	50% to 10%
Hotchkiss.....	10%
Andrews.....	50%
Sargent's Patent Guarded.....	70% to 10% to 5%
Gorgan, new list.....	40% to 10%
Cover, New P. S. E.....	50% to 25%
Cover, New R. E.....	60% to 25%
Covered Spring.....	60% to 10% to 5%
Soldering Irons-	
Covett's Adjustable, list Jan. 1, 1888.....	35% to 25%
Spoke Shaves-	
Wood.....	45%
Stearns.....	30%
Bailey's (Stanley R. & L. Co.).....	40% to 10%
Stearns.....	50% to 10% to 30%
Spoke Trimmers-	
Bonney's.....	50% to 10% to 5%
Stearns.....	50% to 10% to 5%
Ives, No. 1, \$15.00; No. 2, \$12.00.....	50% to 10% to 5%
Douglas.....	50% to 10% to 5%
Spears and Forks-	
Tinned Iron-	
Basting, Cen. Stamp. Co.'s list.....	70% to 10%
Solid Table and Tea, Cen. Stamp. Co.'s list.....	70% to 10%
Buffalo S. S. & Co.....	35% to 25%
Silver-Plated (4 mos. or 6% cash 30 days.)	
Meriden Brit. Co., Rogers.....	50%
C. Rogers & Bros.....	50%
Rogers & Bro.....	50%
Wm. Rogers Mfg. Co.....	50% to 10% to 5%
Simpson, Hall, Miller & Co.....	50% to 10%
Holmes & Edwards Silver Co.....	50% to 10%
H. & E. Silver Co., Mexican Silver.....	50% to 10%
H. & E. Silver Co., Durham Silver.....	50% to 10%
German Silver.....	50% to 10%
German Silver, Hall & Elton.....	50% to 10%
Nickel Silver.....	50% to 10%
Britannia.....	60%
Boardman's Flat Ware.....	50% to 10%
Boardman's Nickel Silver.....	50%
Boardman's Britannia Spoons, case.....	60%
Springs-	
Elliptic, Concord, Platform and Half.....	60% to 50%
Cliff's Bolster Springs.....	25%
Squares-	
Steel and Iron.....	75% to 10% to 5%
Nickel Plated.....	75% to 10% to 5%
Try Square and T Bevels.....	60% to 10% to 5%
Diston's Try Square and T Bevels.....	60% to 10% to 5%
Winterbottom's Try and Miter.....	30% to 10%
Starrett's Micrometer Caliper Squares.....	25%
Avery's Flush Bevel Squares.....	30% to 25%
Staples-	
Fence Staples, Galvanized.....	Same price as B'rd Wire.
Fence Staples, Plain.....	See Trl. Rep.
Steelyards.....	
40% to 10% to 50%	
Stocks and Dies-	
Blacksmith's Waterford Goods.....	30%
Blacksmith's Butterfield's Goods.....	50% to 10%
Lightning Screw Plate.....	25% to 30%
Reece's New Screw Plates.....	35% to 25% to 40%
Stone-	
Hindustan No. 1, 3/4; Axe, 3/4; Slips.....	10%
Sand Stone.....	25%
Washita Stone, Extra.....	15% to 20%
Washita Stone, No. 1.....	14% to 15%
Washita Stone, No. 2.....	10% to 11%
Washita Slips, No. 1, Extra.....	30% to 25%
Washita Slips, No. 1.....	24% to 25%
Arkansas Stone, No. 1, 4 to 6 in.....	\$1.50
Arkansas Stone, No. 1, 6 to 9 in.....	\$1.85
Turkey Oil Stone, 4 to 8 in.....	40%
Turkey Slips.....	\$1.00 to \$1.50
Lake Superior, Chase.....	15%
Lake Superior Slips, Chase.....	31% to 32%
Seneca Stone, Red Paper Brand.....	15% to 20%
Seneca Stone, High Rounds.....	20% to 25%
Seneca Stone, Small Whets.....	25% to 30%
Stove Polish-	
Joseph Dixon's.....	50% to 10%
Gem.....	50% to 10%
Gold Medal.....	50% to 10%
"Mirror".....	50% to 10%
Lustro.....	50% to 10%
Ruby.....	50% to 10%
Shining Sun, 5 gro lots.....	50% to 10%
Dixon's Plumbago.....	50% to 10%
Boynton's Noon Day.....	50% to 10%
Parlor Pride Stove Enamel.....	50% to 10%
Yates' Liquid, 2 3 5 10 gal. cans.....	\$0.90 \$0.70 \$0.50
Yates' Standard Paste Polish, 10-lb cans.....	15%
Jet Black.....	50% to 10%
Japanese.....	50% to 10%
Firestone.....	50% to 10%
Diamond O. K. Enamel.....	50% to 10%
Bonnell's Liquid Stove Polish.....	50% to 10%
Bonnell's Paste Stove Polish.....	50% to 10%
Black Eagle Benzine Paste, 5 and 10 lb cans.....	12% to 15%
Black Jack Water Paste, 5 and 10 lb cans.....	12% to 15%
Nickel Plate Paste.....	50% to 10%
Tacks, Brads, &c.-	
List, Jan. 2, 1888.-	
(Note.-Some manufacturers are selling Tacks at slightly higher prices than those named.)	
American Iron Carpet.....	50% to 10%
Steel Carpet.....	50% to 10%
Swedes Iron Carpet.....	50% to 10%
American Iron Cut.....	75% to 10%
Swedes Iron.....	75% to 10%
Swedes Iron, Upholsterers.....	75% to 10%
Tinned Swedes Iron.....	75% to 10%
Tinned Swedes Iron, Upholsterers.....	75% to 10%
Gimp and Lace.....	75% to 10%
Tinned Gimp and Lace.....	75% to 10%
Swedes Iron Trimmers.....	75% to 10%
Swedes Iron Miners.....	75% to 10%
Swedes Iron Bill Posters or Railroad.....	75% to 10%
Swedes Steel (Swedes Iron price list).....	80% to 10%
Copper Tacks.....	50% to 10%
Copper Finishing, Trunk and Clout Nails.....	50% to 10%
Finishing Nails.....	70% to 10%
Trunk and Clout Nails.....	70% to 10%
Tinned Trunk and Clout Nails.....	70% to 10%
Beak Nails.....	70% to 10%
Common and Patent Brads, 70% to 10% to 50%	
Hungarian Nails.....	
Chair Nails.....	70% to 10% to 50%
Zinc Glaziers' Points.....	50% to 50% to 5%
Cigar Box Nails.....	50% to 10% to 50%
Picture-Frame Points.....	50% to 10% to 50%
Looking-Glass Tacks.....	50% to 10% to 50%
Leathered Carpet.....	50% to 10% to 50%
Brush Tacks.....	50% to 10% to 50%
Shoe Finders, List Jan. 2, 1888.....	10% to 10%
Lining and Saddle Nails, List Jan. 1, 1888.....	30% to 10% to 10%
Japanned.....	30% to 10% to 10%
Double-Pointed Tacks.....	30% to 10% to 10%
Wire Carpet Nails.....	50% to 10%
Wire Brads & Nails, see Nails, Wire.....	
Steel-Wire Brads, K. & E. Mfg. Co.'s list.....	50% to 10%
Tap Borers-	
Common and Rind.....	20% to 10%
Ive's Tap Borers.....	35% to 25%
Enterprise Mfg. Co.....	20% to 10% to 30%
Clark's.....	35% to 25%
Tapes, Measuring-	
American.....	25% to 10%
Springs.....	40%
Chestnut's, Regular list.....	25% to 30%
Thermometers-	
Tin Case.....	80% to 10%
Thimble Skins-See Skins.	
Ties, Bale-Steel	
Standard Wire, list.....	50% to 10% to 5%
Tinners' Shears, &c.-	
Shears and Snips (P. S. & W.).....	20% to 25%
Punches, see Punches.....	
Snips, J. Mallinson & Co.....	35% to 40%
Tinware-	
Stamped, Japanned and Pieced, list Jan. 20, 1887.....	75% to 75% to 5%
Tire Benders, Upsetters, &c.-	
Stoddard's Lightning Tire Upsetters.....	15%
Detroit Perfected Tire Bender.....	15%
Tobacco Cutters-	
Enterprise Mfg. Co. (Champion).....	20% to 10%
Wood Bottom.....	50% to 10%
All Iron.....	50% to 10%
Nashua Look Co's.....	50% to 10%
Wilson's.....	55%
Sargent's.....	50% to 10%
Acme.....	50% to 10%
Transom Lifters-	
Wollensak's Class 3 and 4, Bronzed Iron.....	50%
Class 3 and 4, Bronze Metal.....	25%
Class 3 and 4, Brass.....	35%
Skylight Lifters.....	35%
Crown, Eagle and Shield.....	50%
Reith's Bronzed Iron Rods, list Jan. 1, 1887.....	50% to 25%
Reith's Real Bronze or Nickel Plate.....	50% to 25%
Excelsior.....	50% to 10%
Shaw's.....	50% to 10%
Payson's Universal.....	40% to 10% to 10%
Traps-	
Game-	
Newhouse.....	75% to 40% to 25%
Oneida Pattern.....	30% to 70% to 5%
Game, Blake's Patent.....	40% to 10% to 5%
Mouse and Rat-	
Mouse Wood Choker.....	50% to 10%
Mouse, Round Wire.....	50% to 10%
Mouse, Cage, Wire.....	50% to 10%
Mouse, Cat, alive.....	50% to 10%
Mouse, "Bonanza".....	50% to 10%
Mouse Delusion.....	50% to 10%
Rat, "Decoy".....	50% to 10%
Ideal.....	50% to 10%
Cyclone.....	50% to 10%
Hotchkiss Metallic Mouse, 5-hole traps.....	50% to 10%
In full cases.....	50% to 10%
Trowels-	
Lothrop's Brick and Plastering.....	25%
Reed's Brick and Plastering.....	15%
Diston's Brick and Plastering.....	25% to 25% to 10%
Peace's Plastering.....	25%
Clement & Maynard's.....	20%
Rose's Brick.....	15% to 20%
Brade's Brick.....	25%
Worrall's Brick and Plastering.....	20%
Garden.....	70%
Triers-	
Butter and cheese.....	25%
Trucks, Warehouse, &c.-	
B. & L. Block Co.'s list, '82.....	40%
Tubes, Boiler-	
See Pipe.....	
Twine-	
Flax Twine.....	BC. B.
No. 9, 1/4 and 1/2 lb Balls.....	22 30%
No. 12, 1/4 and 1/2 lb Balls.....	21 20%
No. 15, 1/4 and 1/2 lb Balls.....	18 20%
No. 24, 1/4 and 1/2 lb Balls.....	18 20%
No. 36, 1/4 and 1/2 lb Balls.....	16 20%
No. 36, 1/4 and 1/2 lb Balls.....	16 20%
Chalk Line, Cotton, 1/4 lb Balls.....	45% to 50%
Mason Line, Linen, 1/4 lb Balls.....	55%
2-Ply Hemp, 1/4 and 1/2 lb Balls (Spring Twine).....	11% to 11%
3-Ply Hemp, 1 lb Balls.....	12% to 12%
8-Ply Hemp, 1 1/2 lb Balls.....	11% to 11%
Cotton Wrapping, 6 Balls to lb.....	15% to 15%
2, 3, 4 and 5-Ply Jute, 1/2 lb Balls.....	10%
Wool.....	60% to 60%
Paper.....	13% to 14%
Cotton Mops, 6, 9, 12 and 15 lb to doz.....	18%
Vises-	
Solid Box.....	60% to 60% to 5%
Parallels.....	
Fisher & Norris Double Screw.....	15% to 10%
Stephens.....	25% to 30%
Parker's.....	
Wilson's.....	20% to 25%
Howard's.....	55%
Bonney's.....	40%
Millers Falls.....	40% to 10% to 10%
Trenton.....	40% to 50% to 10% to 10%
Merrill's.....	15% to 20%
Sargent's.....	60% to 10% to 10%
Backus and Union.....	15% to 10%
Double Screw Leg.....	15% to 10%
Prentiss.....	20% to 25% to 10%
Simpson's Adjustable.....	40%
Saw Filers-	
Bonney's, Nos. 2 & 3.....	50% to 10% to 10%
Stearns.....	35% to 10% to 10% to 10%
Stearns' Silent Saw Vises.....	35% to 35%
Sargent's.....	60% to 10%
Hopkins.....	50% to 10%
Reading.....	40% to 10%
Wentworth.....	20% to 10%
Combination Hand Vises.....	50% to 10%
Cowell Hand Vises.....	20%
Bauer's Pipe Vises.....	10%
Wagon Boxes-	
Per lb.....	25%
Wagon Jacks-	
Daisy.....	50% to 10% to 10%
Washer Cutters-	
Smith's Pat.....	50% to 10% to 10%
Johnson's.....	50% to 10% to 10%
Penny's.....	50% to 10% to 10%
50% to 10% to 10%	
Appleton's.....	50% to 10% to 10%
Bonney's.....	50% to 10% to 10%
Washers-	

THE IRON AGE

THURSDAY, JANUARY 24, 1889.

New Forging Machine.

Among the tools for forging iron which have been recently brought out is a header built by the National Machinery Company, of Tiffin, Ohio. This tool is the result of several years' experience and experiment, and its builders believe that in many ways it is a decided advance on anything heretofore constructed for the same purpose.

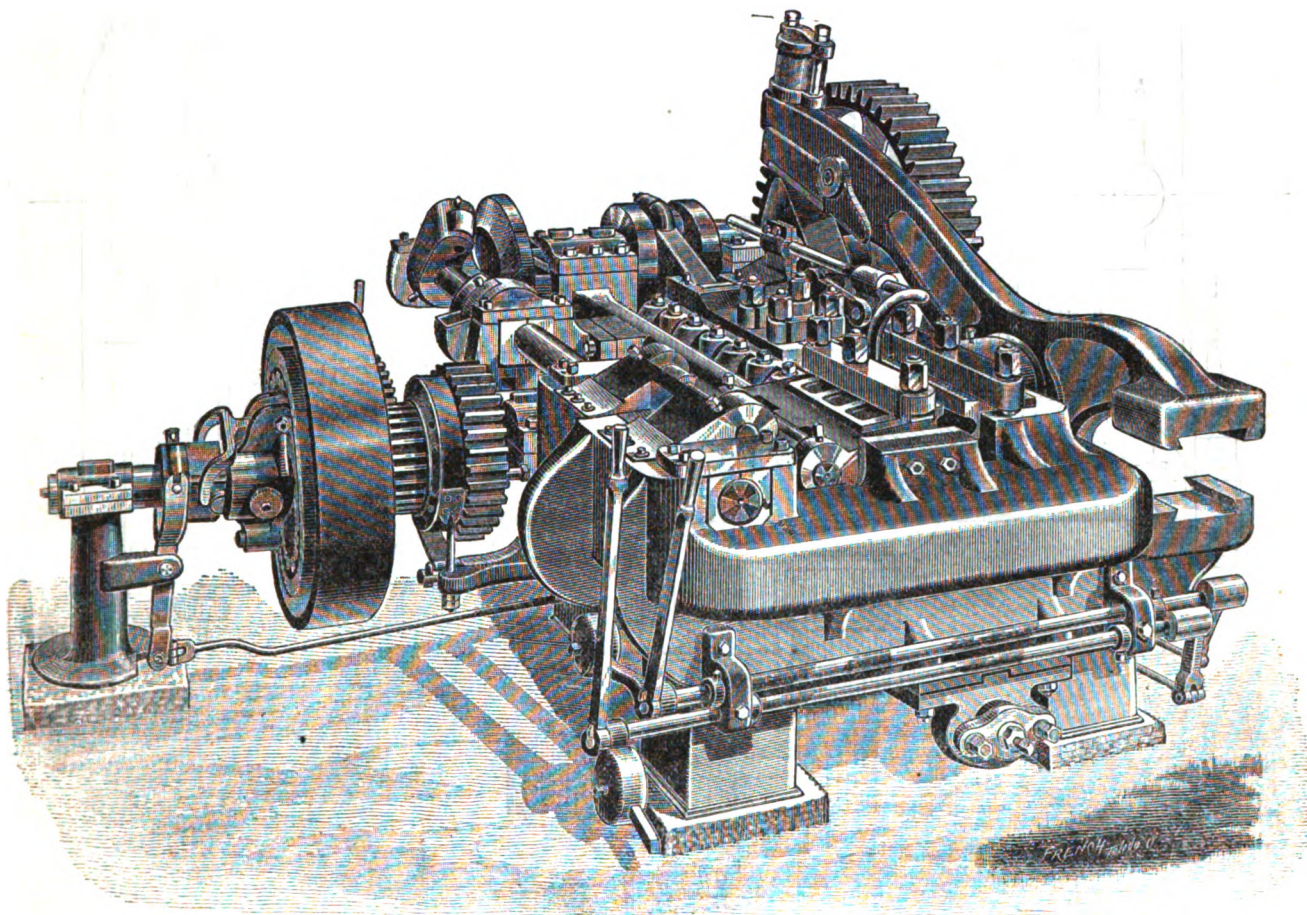
The machine is designed for heading bolts, rivets and car pins, upsetting ends of truss rods, stud ends for connecting rods, round and flat eye bars, &c., also

wheel, is a friction clutch operated by the levers A' and B'. These levers are held in position by the weights C' and D'. The lever A', Fig. 2, starts the machine and gives one or more entire strokes and when relieved stops the machine on its back stroke, leaving the dies open; when used with lever B' (drawn forward) it will stop or start the machine in any position. This gives the operator an opportunity to set his dies without barring the machine around, also to stop the machine in case there should be more stock allowed than can be forced into the dies. The clutch T is on a sleeve on the shaft X, which sleeve

be fastened into the tool holder T', furnished with this machine.

The stock gauge E', Fig. 5, is on a hanging arm operated by a rocker, F', and block, G'', on the header slide. This gives a rapid motion in raising and lowering and locks it in position, preventing the clattering of the old-style gauge.

The grip cam C, Fig. 4, is a side cam operating alternately on the arms B G, pivoted on the rack shaft B. The rolls 2 2 are conical, and all elements of both cam and roll intersect in the intersection of the axes D and B, thus avoiding all surface friction. The control of the rolls and



FORGING MACHINE, BUILT BY THE NATIONAL MACHINERY COMPANY, OF TIFFIN, OHIO.

welding links and turnbuckles, and, in the hands of an ingenious man, it is hard to say what cannot be accomplished by its aid. Often, where the machine itself does not finish the forging, it will put the stock in shape for the drop or steam hammer.

The machine in operation is very similar to the Pittsburgh or Chapin headers—that is, it has a gripping mechanism to hold the rod and confine the stock while a plunger acts on the projecting end. On some kinds of work the enlarged end is forged by the confining dies, as in a machine bolt where the stock is confined on but two sides and afterward forged into shape by turning and re-gripping.

The bed-plate or frame of this machine A, Figs. 1 and 2, is a single massive casting, and the strains come direct on this casting without the intervention of bolts or other tension members. The machine is driven by an 8-inch belt on a 36-inch pulley. On this pulley, R, which also acts as a fly-

also carries the pinion A'' and gear wheel B'', and may be held from revolving by the slip-bolt 2 in case very heavy work is wanted. The back gear U U'' C'' which runs on a heavy eccentric stud, is thrown in and locked in place and the machine is back geared 14 to 1, with the gear out it is back geared 4½ to 1. In back gear it gives 12 strokes per minute and out of back gear 37 strokes per minute. The main crankshaft D is 9 inches in diameter and has bearings 13 inches long. The heading slide A is very long, runs on wearing pieces in the bed and has square gibs which can be set up so as to reduce lost motion to a minimum. This construction permits the slide to be easily trued up when the unavoidable cinders and scale wear the surface out of true. The crank connection P' works in a brass knuckle box, P'', and has a 10-inch diameter by 6-inch bearing on crankshaft. The tool is clamped in a recess in the heading slide by means of two heavy clamping bars, R' S', or if made with a round shank can

arms by the cam C is direct, and there is almost no power wasted in useless components of pressure. The lever G is loose on the shaft, and is rigidly held attached to the shaft by the piece H'', keyed to shaft and the breaker I''. This breaker falls and allows the lever to drop back if the work gets between the dies. This rack shaft B is of ample size, and runs in brasses.

On the forward end of B the short crank Z', Fig. 3, is keyed and operates on the grip jaw H, Figs. 1, 2 and 3, through the connection Y. This gives the toggle grip the full length of jaw H, thus preventing its springing at the mouth of dies as in present machines. The wear is confined to the connection Y', and the toggle pins which are 2½ inches in diameter and have a bearing 17 inches in length on connection Y'. The grip jaw H swings on a pin, J', at its lower end. The pin is so placed that the opening of the jaw for the first 2 inches of its motion is practically in a straight line. The wear on pin J'' is

taken up by conical brass brushes which are forced into a tapered hole. The heading strain is sustained by the wearing piece I". The lever I moves thrice to each revolution of shaft and is operated by the three-lobed cam 8 through the shoe J and the rubber cushion 9. In the front end of the lever I and the lug on bed A' dies can be placed to give a bend to the stock or reduce it a little or modify it in some way, or shearing dies for trimming ends can also be put in. The cushion

of shovels and spades to be rated as blanks, without exception, \$1 per dozen and 25 per cent.

The Lehigh Valley Semi-Centennial.

The *Catasauqua Dispatch* prints a letter from Oliver Williams, the well-known iron manufacturer, which we reprint as follows:

On July 4, 1890, now but eighteen months in the future, there will occur an anniversary that will not only be of local

remained for an unknown man, from a distant land, to make, not only a mechanical, but a commercial triumph of the undertaking.

It was in 1839 that the Lehigh Coal and Navigation Company brought this man to this country, and at their suggestion he selected the site of Catasauqua as a fit place to try the experiment of utilizing the at that time almost valueless iron ores of Lehigh County by the use of the then equally valueless anthracite coal of Carbon

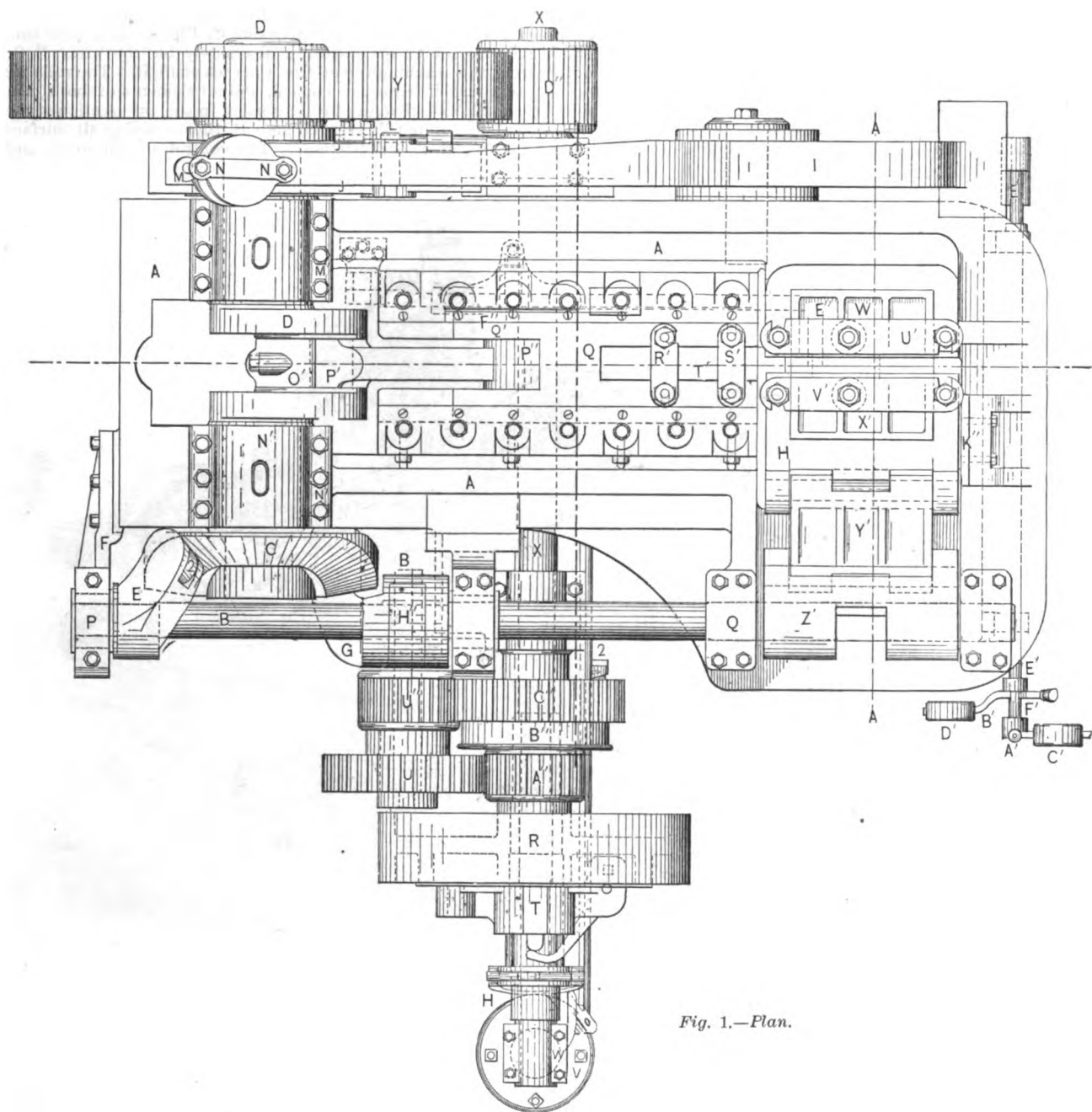


Fig. 1.—Plan.

FORGING MACHINE, BUILT BY THE NATIONAL MACHINERY COMPANY, OF TIFFIN, OHIO.

gives an elasticity somewhat like a cushion hammer, without which drawing out stock would be impracticable.

The data of the machine are as follows: Grip opens $3\frac{1}{4}$ inches; die box is 17 inches long, 18 inches wide, and takes two die blocks $17 \times 9 \times 6$ inches; the header slide has 12-inch stroke and will gather $62\frac{1}{4}$ -inch stock; header slide makes 12 strokes per minute for heavy work and 37 strokes for light work.

The Customs Department of the Dominion has announced, under date of Ottawa, January 2, that the rate of duty on steel file blanks is 30 per cent. and that the rate on steel cut to shape for the manufacture

interest, but it will be the semi-centennial of an event that has developed into national importance. From the experiment of that day has grown an industry so vast that it has not only been one of the main factors in promoting the wonderful material prosperity of this country, but it has become the barometer by which its commercial condition is constantly gauged. It was on the 4th day of July, 1840, after months of weary labor, that the first furnace to successfully and profitably smelt iron ores by the use of anthracite coal made its first cast. Several attempts to accomplish this end had been made previously in other parts of Pennsylvania, and with some degree of success, but it

County. Single handed, he went into the undertaking; no trained help at his bidding, no foundries, no machine shops, no mechanical engineers, no fire-brick works worthy the name in the whole land. Every phase of discouragement conspired to make the trial a failure, but all obstacles were surmounted by the indomitable determination of one man, and the outcome has been marvelous. During 1840 less than 1500 tons of anthracite pig iron was produced in the United States—in 1890 8,000,000 tons will easily be the output. The story now reads like a romance; but there are men and women still living who were old enough and close enough to the great central figure of the undertaking to

distinctly remember how little of romance there was in the daily struggle with the combined adverse forces of nature and of man, and to those of us who know how savage the opposition of the latter was, it is difficult at this day to determine which was the harder to overcome.

One thing is certain, the men who were in a position to appreciate the greatness of

bodied in some more durable form than that of the heart or even of the written page. What more fitting than a monument of bronze on a pedestal of pig iron. The cost may be more than the people of Catsauqua alone could defray, but David Thomas has friends all over this great country, who would be glad to contribute to such a fund. Eighteen months, however,

The Direct Process at Brewsters.

The Coneley Rummell Iron and Steel Co., of Brewsters, N. Y., will put up 20 retorts to manufacture iron direct by the Blair process, modified. The company use concentrates from the Theall mine, operated by the Cheevers, mixes them with ground charcoal, and exposes them

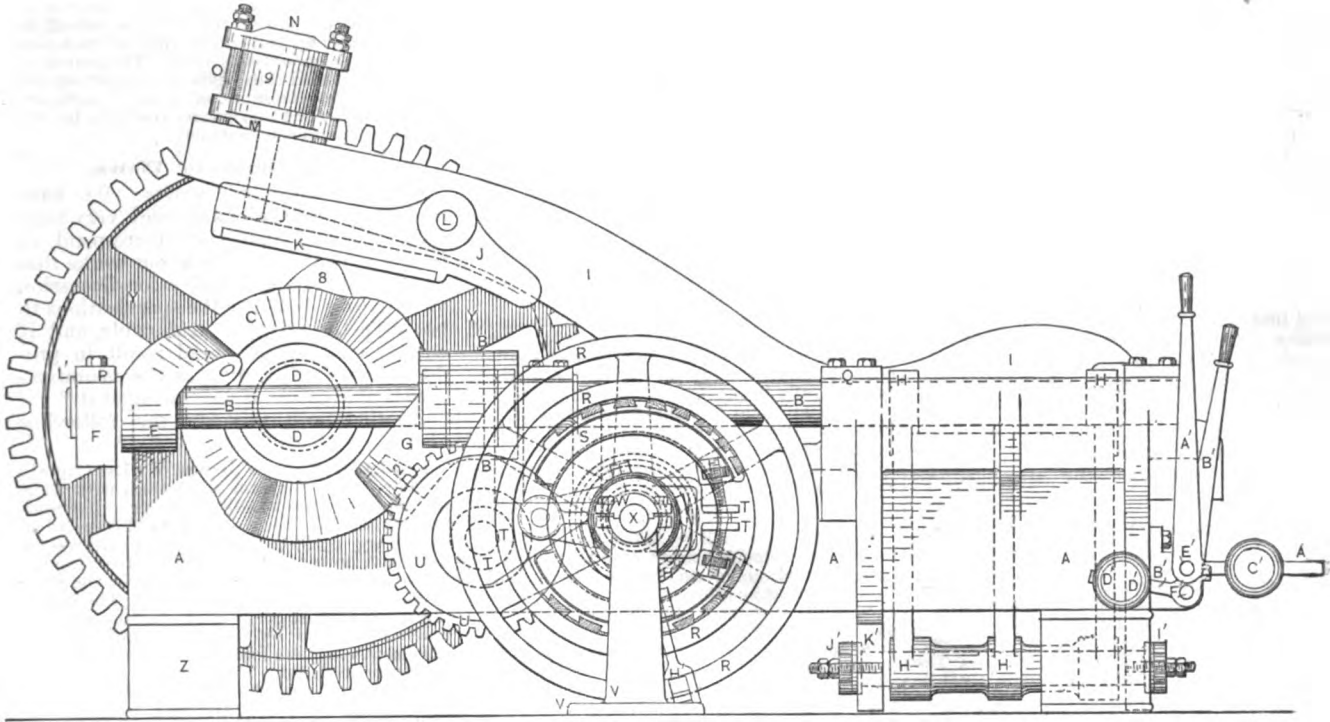


Fig 2.—Cross Section.

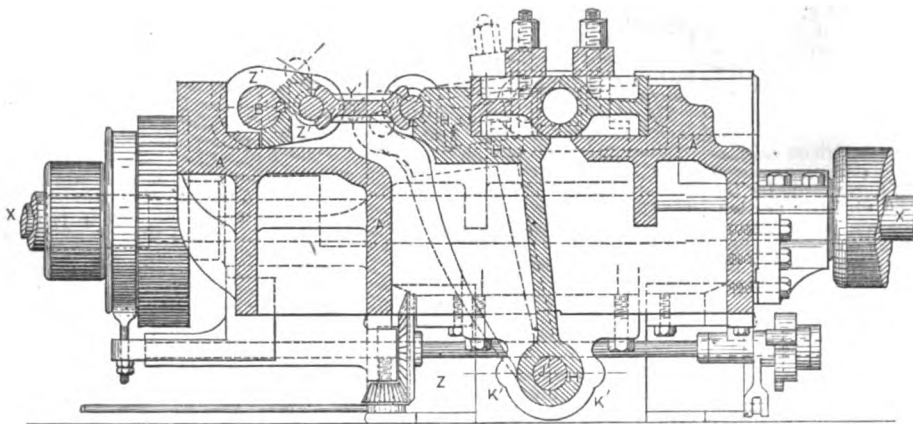


Fig 3.—Section through A A.

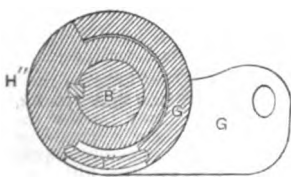


Fig 4.—Grip Cam.

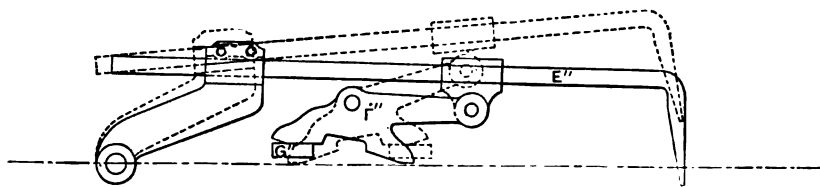


Fig 5.—Stock Gauge.

FORGING MACHINE, BUILT BY THE NATIONAL MACHINERY COMPANY, OF TIFFIN, OHIO.

the task then begun now stand amazed at the completeness of the victory won, as measured by the advantages enjoyed. David Thomas, the victor in this great struggle, has passed away. His memory is still cherished in the hearts of hundreds who knew him and honored him. In a few years more, these hundreds will have passed over to the "land of the majority." It seems but fitting that his name and the story of his achievement should be em-

is but a short time to prepare for what can be made the greatest gathering ever held in the Lehigh Valley. Whatever is to be done must be done quickly. Whatever is done should not be determined on solely by the citizens of Catsauqua, but should be the combined work of a committee of the best men from Easton to Mauch Chunk. There is no man in this valley, however distinguished he may be, but would esteem it an honor to be on such a committee.

to the proper temperature in horizontal cast-iron retorts in which rotates a hollow water-cooled arm provided with plow blades. In three hours and a half the ore is reduced. Formerly it was shot into closed cars, allowed to cool, and was mixed with pitch and poured into barrels, to be shipped in that form to crucible and open-hearth steel manufacturers. The charge is about 1200 pounds. The company are getting ready to put up two

double puddling furnaces, to use them for balling the iron product, and will also put in a trip-hammer.

HUNT'S RAIL SPECIFICATIONS.

Rail Managers Discuss Them.

In *The Iron Age* of October 25 we published the greater part of a paper read by R. W. Hunt, of Chicago, at the Buffalo meeting of the American Institute of Mining Engineers. It was in substance a presentation of specifications for the manufacture of steel rails, with the grounds which led to the adoption of the requirements embodied in them. Coming as they did from one whose experience as an engineer and manager reaches back to the infancy of the manufacture in this country, they commanded attention. *The Iron Age* invited an expression of opinion from steel makers, while our contemporary, the *Railroad Gazette*, of this city, brought out the views of leading railroad engineers, which we take pleasure in presenting herewith, as we have no doubt they will prove interesting to our readers. Since correspondents refer frequently to the different sections we reproduce the specifications themselves.

HUNT'S SPECIFICATIONS FOR STEEL RAILS.

Section.

Section 1.—The section of the rail rolled shall conform to the template furnished by the railroad company with an allowance in height of 1-64 inch under and 1-32 over, being permitted in a delivery of 10,000 tons of rails. The fit of the fishing or "male" template shall be maintained perfect.

Sec. 2.—The weight of the rail shall be kept as near to pounds per yard as is practical after complying with Section 1.

Lengths.

Sec. 3.—The standard length of rail shall be 30 feet at a temperature of 60° F. Shorter rails of lengths will be accepted to the extent of 10 per cent. of the entire order. A variation in length of $\frac{1}{4}$ inch longer or shorter than the above specified lengths will be allowed.

Finish.

Sec. 4.—The rails must be free from all mechanical defects and flaws, and shall be sawed square at the ends, and the burrs made by the saws carefully chipped and filed off; particularly under the head and on top of the flange. In sawing care must be taken to avoid a flow of steel, which will produce a swell on the top of lower flange, as the rail lies under the saw, thereby affecting the fit of the fish-plate.

Sec. 5.—The rails shall be smooth on the heads, straight in all directions, both surface and line, and without any twist, waves, or kinks, particular attention being given to having the ends without kinks or drop. The hot straightening shall be carefully done, so that gagging under the cold press will be reduced to the minimum, and so applied that the rails shall not be made "lumpy."

Drilling.

Sec. 6.—Circular holes $\frac{1}{4}$ inch in diameter shall be drilled through the web at $\frac{1}{4}$ inches from the bottom of the flange. The center of the first hole $\frac{1}{4}$ inches from the end of the rail; and $\frac{1}{4}$ inches from the center of the first to the center of the second hole, and so on if more than two holes are required. These holes must be accurate in drilling in every respect, and left without burrs.

Branding.

Sec. 7.—The number of the charge, the name of the maker, the month and year of manufacture, shall be marked in plain letters and figures on the side of the web of the rail in such a position as not to be covered by the fish-plates when laid in the track. If the purchaser prefers, the number of the charge shall be stamped on the end of the rail.

Percentage of Carbon.

Sec. 8.—The steel to contain as high a percentage of carbon as the maker is willing to put in and still meet the requirements of Sections 9 and 21.

Tests.

Sec. 9.—While the heat is being cast, two (2) test ingots shall be made. The first from steel going into the first regular ingot, the other from metal representing the last one. These test ingots shall be 3 x 8 inches and not less than 4

inches long. From them bars at least $\frac{1}{4}$ -inch square shall be drawn at one heat by hammering. Each bar when cold shall be bent, without breaking, by the blows of a sledge to not less than a right angle. Should one bar from a heat fail and the other stand the test, a third bar may be taken from a bloom rolled from the same ingot represented by the failed bar. If this stands the test it shall be accepted in lieu of the failed one. If the makers choose, more than the two test ingots may be taken, but they must be from the steel of the first and last regular ingots. If this is done and a test bar fail, another one may be drawn from the duplicate ingot and tested, and if it stands, accepted.

Treatment of Ingots.

Sec. 10.—After the ingots are cast they shall be either constantly kept in an upright position until ready to be rolled, or else so maintained until the interior steel has had time to solidify.

Sec. 11.—No "bled" ingots or ingots from "chilled" heats shall be used in the manufacture of rails under this contract.

Sec. 12.—No ingots from badly teemed heats shall be used, excepting as they shall be subject to the provisions of Section 18.

Cutting of Blooms.

Sec. 13.—After cutting off, or allowing for the "sand" or top end of each ingot, at least 12 inches more of seemingly solid steel shall be cut off that end of the bloom or partially formed rail; if the latter, then the pieces so cut off shall equal 12 inches in length of a 7 x 7 inch bloom; a greater length than 12 inches being preferred; and if after cutting such length the steel does not look solid, the cutting shall continue until it does.

Heating.

Sec. 14.—Care shall be taken to avoid overheating the steel in shape of either ingots or blooms; and under no circumstances shall a "cinder" heat be allowed—that is, a heat high enough to cause the cinder to run off the steel as it is being drawn from the furnace. This does not apply to cinder which may be sticking to the under side of the steel, when drawn from a horizontal furnace, or to the bottom of an ingot when drawn from a soaking pit.

Inspection.

Sec. 15.—Inspectors representing the purchaser shall have free entry to the works of the makers at all times while this contract is being filled, and shall have all reasonable facilities afforded to satisfy them that the rails are being made in accordance with these specifications. The makers shall furnish them with the carbon determinations of each heat, if so required.

Sec. 16.—The inspectors shall have power to reject rails made from insufficiently sheared blooms, or from heats the test pieces of which have failed, or from badly poured heats, or from "chilled" heats, or from "bled" ingots. The rails made from uncut blooms, if otherwise perfect, to be received as No. 1 short rails, if sufficient lengths have been sawed off to make an amount of steel equal to the original demand of 12 inches. The rails made from heats, the test pieces of which have failed, may be accepted as No. 2 rails. The rails from a badly poured heat may be received as No. 2 rails, but if made from a "chilled" heat or "bled" ingot to be absolutely rejected. By an imperfectly poured heat is meant one which from any cause has been teemed without the control of the operator. A "chilled" heat is one which, from the steel chilling, has to be either pricked or poured over the top of the ladle. A "bled" ingot is one from the center of which the liquid steel has been permitted to escape.

Sec. 17.—Imperfectly drilled, straightened or chipped or filed rails shall be rejected, but will be accepted after being properly finished.

Sec. 18.—Rails failing to comply with Section 1 will be rejected as No. 1 rails.

No. 2 Rails.

Sec. 19.—The requirements of No. 2 rails shall be the same as for the No. 1, excepting they will be accepted with a flaw in the head not exceeding $\frac{1}{4}$ inch, and flaws in the flanges not exceeding $\frac{1}{4}$ inch in depth, and may have been made from an imperfectly poured ingot or heats from which the test bars have failed.

Sec. 20.—No. 2 rails to the extent of per cent. of the whole order will be received.

Guarantee.

Sec. 21.—The rail makers to guarantee the No. 1 rails against breakage and unusual wear at the ends or elsewhere for five years from the time of delivery to the railroad company; and should any such rails so fail, will, upon the return of such failed rails to their works, deliver free of cost on cars at their works perfect rails to replace such failed rails, the failure of which is not attributable to improper laying or want of care after being laid, or unusual circumstances of derailment from failure of other railway machinery or appliances, or

negligence of the railroad company's employees. In event of failure at the ends or elsewhere of the No. 1 rails, not exceeding 10 per cent. of the amount of the contract before the expiration of five years' guarantee (and when the rails in all other respects warrant such a course), the railroad company will cause to be cut off so much of such rails as may be necessary to make perfect rails of them, but in no case leaving them less than feet in length, the maker to pay in cash for cutting, redrilling, and restraughtening such rails. The loss in weight so sustained by the railroad company to be made up to them by the makers on the return to them of the pieces so cut off in good and perfect full-length rails of such section as may be agreed upon. The points of delivery of failed rails, ends of rails cut off and rails to replace the same, or mode of such settlement, may be varied to conform to the peculiarities of each contract.

The Railmakers' Views.

One correspondent writes: "I have read the specifications through very carefully and find that they correspond so closely with the practice at our works that I really find no opportunity for discussion or criticism. I believe the specifications to be perfectly fair and reasonable, and if strictly carried out would result in producing good rails, as far as the manufacturer is able to see or provide against."

Another mill presents the following views:

I heartily subscribe to most of what Captain Hunt recommends, and think that, with some modifications, his specifications are judicious and reasonable. Up to section 9 of his specification I see nothing on the list to criticize. I must say, however, that I am far from having the confidence which he expresses in the style of test recommended in section 9. The breaking angles of test pieces taken in this way are much influenced by the manipulation of the blacksmith and the temperature at which they are hammered out. The varying results thus obtained have caused us to lose confidence in this method of testing, although we still continue its use. The drop test is not so convenient, but is more reliable in showing the strength of the rail as it really is and by indicating the grade of metal which may be advisable for the particular section which is being tested. The shortcoming of both methods is that, although the strength of the metal may be indicated, the wearing qualities are only indirectly indicated.

In section 10 it seems to us that unnecessary stress is laid upon keeping the ingot "in an upright position until rolled, or else so maintained until the interior steel has had time to solidify." This would compel the abandoning of all furnaces in which the ingot is heated in a horizontal position, or else the holding of the ingot in an upright position until the interior steel had time to solidify before putting into the furnace. This latter alternative would be very objectionable in the light of our practice, as we find that the sooner the ingots are put into the heating furnace after stripping the better they roll, and the colder they are allowed to get before heating the more likely they are to crack in rolling and make second quality rails. It may be injurious to the ingot to throw it violently upon its side in the pit immediately after stripping, but we think it will be difficult to show any injurious effect from placing it (after the top is well set) horizontally upon a car, and transferring in that position to the heating furnace. There does not seem to be anything objectionable in the remaining sections.

Another correspondent writes:

These specifications do not impress me as at all desirable for securing the best results, and they convey more of an essay on the method of making steel rails than a clear-cut exposition of what can be reasonably required of steel-rail makers. The practice hitherto pursued by the purchasers of steel rails has been to follow one of two lines of specifications. The first is to submit the chemical constituents that are demanded in the rails. This is simple and direct, and when the rail-maker conforms to this, he has fulfilled all that can be required of him. I may say here, that the pursuit of this course has proved a very serious failure. The second line of requirement in the manufacture of steel rails is in the purchaser demanding that the steel rails stand certain tests independent of their chemical composition. These physical tests to be applied under the care of the inspector of rails, and if they conform to this condition, no complaints can be reasonably made in regard to any other matter.

I hold it as a general principle that whilst manufacturers of rails are not inclined to submit all the operations to an intellgent inspector, yet they hold the position in all its strength, that the trained men of the manu-

factorer are the best agents in assuring satisfactory results in the manufacture of steel rails.

As to the five years' guarantee, no manufacturer of steel rails who has any character at all would tolerate this condition for a moment. If the purchaser insists on chemical and physical tests, and the manufacturer has conformed to these tests to the satisfaction of the inspector of rails, it is quite evident that no further demand should be made of the manufacturer. Parties asking this five years' guarantee intend to cheat somebody, because the manufacturer has no control of the condition of the tracks, and they may put his rails into some miserable mud bed, in which the ends will be hammered to pieces in one or two years, and ask him then to supply rails for those that were unfairly treated by the inadequate ballast of his track; or the business of the road may be increased from the time such guarantee is given, demanding very much more duty from the rails than anticipated in the guarantee; or, the increased weight of locomotives and rolling stock may demand a very large increased wear on the rails, which could not be anticipated at the time of the guarantee. On the whole, I would suggest that these specifications need an absolute and entire remodeling, omitting the details of the manufacture of rails in all their conditions. To insist upon one or two series of tests, either chemical or physical, and one of these to be satisfactory to the purchasers, if they come up to the agreement in the specifications for such tests.

The superintendent of a leading mill reviews the specifications as follows:

Under Section 1 to 7 inclusive we see nothing objectionable.

Section 8. There is little doubt that rails, with as high percentage of carbon as may be, and avoiding brittleness at the same time, will give best wear, and, if made of good stock, can be made safe against breakage with a track in ordinary good condition. It is not clear whether this section is intended to stand as it reads in a specification attached to contract, or to have definite carbon limit preagreed upon.

Sec. 9. The practice of drawing a bending test piece from a cutting off of bloom commands itself as much to be preferred over test ingots 3 x 3 x 4 inches. There is an inevitable difference in the structure between such small ingots and large ones, especially a sponginess of small ingot. From this cause a specimen taken from a large ingot itself—that is, from the bloom reduced from the large ingot itself—is more truly representative of the material in the rails. Since it is pure accident if a drop test discovers a defective rail, or any quality except either hardness or brittleness, defects are really best guarded against by good regular practice on the part of the manufacturers, and Mr. Hunt's remarks that he should certainly discourage contracting for rails with other than those works whose practice is good, is commendable, and appears to be the keynote upon which the specification is written outside of the guarantee.

The bending test applied early in the manufacture is a better check for the maker than the drop test can ever be. The drop test, while very simple in operation, is difficult to interpret further than as to hardness or softness. It will furnish a check here, but carbon tests answer equally well and are applied to every heat, and to do which becomes an expense with the drop test.

Bending by blows of the sledge is not good. Bending under a former is more regular, hence a fairer test. The radius of inside curve is not mentioned. It should be given at $1\frac{1}{2}$ times the diameter of the bar.

Sec. 10, 11 and 12. See remarks under heading of Section 16.

Sec. 13. This touches a point upon which we would consider more information desirable. We note, in a general way, a difference between top and body of ingot, but we are not aware of any careful investigation having been made as to exactly how much apparently steel is unreliable or likely to cause battered rail ends.

Sec. 14. This is correct practice, but a still more valuable point to watch, if the trade warranted it, would be the heat at which rails are finished.

Sec. 15 and 16. These imply substantially the constant presence of an expert in rail manufacture at the works of contractor during the execution of an order. If rail experts could be found in sufficient number, and at low enough cost, doubtless the purchasers might be benefited by such inspection. It is believed, however, that it is bad to give the inspector (as inspectors go, or granting a reasonable improvement in the craft) such powers as are given by Section 16. Such powers might be safely intrusted to Mr. Hunt himself, and hence makers as well as buyers would be safe under specification and Mr. Hunt; but the specifications strike us as being of a character which needs to be supplemented in the bidder's mind by a knowledge of who the inspector is to

be. We consider this to be such a defect as to condemn the specifications for general use.

Sec. 21. We suggest a guarantee as this compliance with Sections 8, 9, 10 11, 12, 13, 14 and 16, or such modifications of the practice therein outlined as the judgment of makers might dictate, may safely be left to the makers themselves. It is not an unusual proceeding for buyers before giving out a large contract to satisfy themselves in regard to the capacity and practice of bidder, and this, it is pretty safe to say, is all that would commonly be done (by deputizing an expert, say in the person of Mr. Hunt) under these specifications. Makers do not object to giving intending buyers this kind of information, and would much prefer giving it once for all to the headquarters rather than instruct and train each new young man who may be sent to see that these specifications are enforced. As Mr. Hunt says, if the works practice is not satisfactory, do not buy their rails. As a whole, the specifications abandon the objective point toward which effort has been directed in the past, and which we think the proper directions to work in (or allow us to cut down the specifications rather than expand them)—namely, to specified qualities of product rather than modes of manufacture. They look to a supervision of manufacture rather than an inspection of product as far as concerns quality of material. When buyers insist upon a certain mode of manufacture, it is decidedly unfair to exact a guarantee in addition. As a move toward improving the inspection business, the specifications are well calculated.

The manager of a large mill says: "I consider the specifications of Capt. R. W. Hunt as being based on practical experience, and I can see no objection to them, with the possible exception of Section 21. The greatest evil in connection with the maintenance of a good smooth railway is crushed rail ends. As a rule, crushed rail ends are caused by faulty designs of rail sections, and fish-bar connections, and bad roadbed and poor maintenance. If a rail batters at the ends without showing any defects, while the main body of the rail shows good wearing qualities, it is the fault of the railway. Captain Hunt's specifications, Sections 4 and 18, guarantees almost absolute protection from the evil of split-ends, and at the start of the service of a steel rail, a low joint—viz., a close inspection of the ends, to see they have no short 'kinks or droops,' and the liberal cropping of the bloom that represents the top of the ingot, giving good sound material in the bloom. So far as Section 21 is concerned, that is for the mill owners to consider."

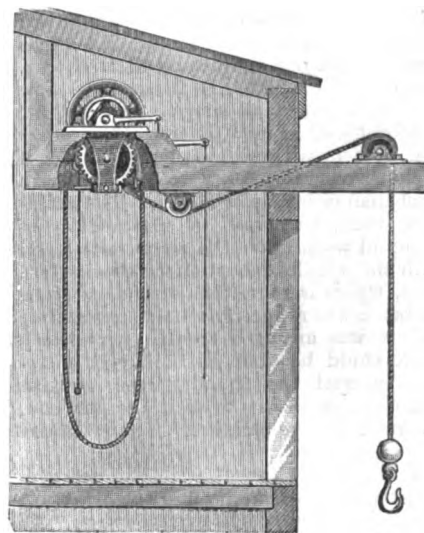
Electric Welding of Metals.—The Thomson Electric Welding Co. are now moving into their new factory at Lynn, Mass., where they have abundant facilities for the production of their welding apparatus. The factory is 200 feet long, 85 feet in width and furnished with 500 horsepower engines from the Providence Steam Engine Co. Their welding machines are now in active and successful operation in the factories of Wallace & Sons, Ansonia, Conn., Roebling's Sons Co., The Trenton Iron Works, Trenton, N. J., and elsewhere. They have lately received orders from the United States Government for apparatus for welding steel wire for guns. The contract was awarded them after very exhaustive experiments had been made by the Ordnance Department, with the view of securing the best process of welding this wire. The company are rapidly developing the large field for welding, brazing, &c., which their process covers.

Mr. H. P. Smith, one of the leading stockholders and general manager of the Allegheny Bessemer Steel Company, has been South for some time past for the benefit of his health. The company in question have booked several orders for rails and it is expected that the rail department of the works will soon be in operation. Mr. Smith was for several years with the firm of Carnegie, Phipps & Co., and had charge of the Homestead Mill of the firm last named. While not of the capacity of the Edgar Thomson Works, the rail mill of the Allegheny

Bessemer Company is said to be one of the most complete in the country, having been supplied with all the latest improvements and appliances. Mr. W. G. Perk, of the Black Diamond Steel Works, is one of the active men in the management of the Allegheny Bessemer Company.

Outrigger Hoist.

We show herewith a compact and complete outrigger hoisting apparatus, made in two sizes of 500 and 1000 pounds capacity by the Energy Mfg. Company, 1115 South Fifteenth street, Philadelphia. As will be seen, the hoisting gearing is placed on two beams inside of building so that it is protected from the weather, the only part being exposed is the rope used for raising the loads. The ropes can be made any length desired. This hoist is fitted with double-acting brakes, both controlled by one brake cord. One being automatic, holds the load at any point when hoisting, and will not allow the load to run down when the hand rope is let go. The other is used when lowering to control speed. By regulating the pull on the brake cord, the load can be lowered quickly or slowly.



Outrigger Hoisting Apparatus.

If the brake cord is pulled hard or let go, the hoist is stopped, so that no accident can be caused by the neglect of the operator. The prices being low, they are within the reach of any desiring a hoisting machine of this class.

The utilization of water-power is a problem that is being agitated by a large number of Michigan towns, in view of the recent practical demonstration that it can be used to furnish electrical distribution for both power and light. Many towns in that State are situated within a few miles of swiftly flowing streams, whose value as an agency of power has never been fully realized. Some have waterfalls within their incorporated limits. Marquette proposes to take the initiative, and is now at work upon an elaborate and at the same time peculiar scheme for the manufacture of the electric current.

In a recent issue we alluded to the fact that the basis of the sliding scale of wages at the Edgar Thomson Steel Works, Braddock, Pa., for this month was \$30, against \$28.50 the previous month. The statement caused considerable surprise, to which we gave expression. We understand that the cause of the advance in the rate is the fact that the mill happened to have some \$85 rails to make, which brings up the average considerably.

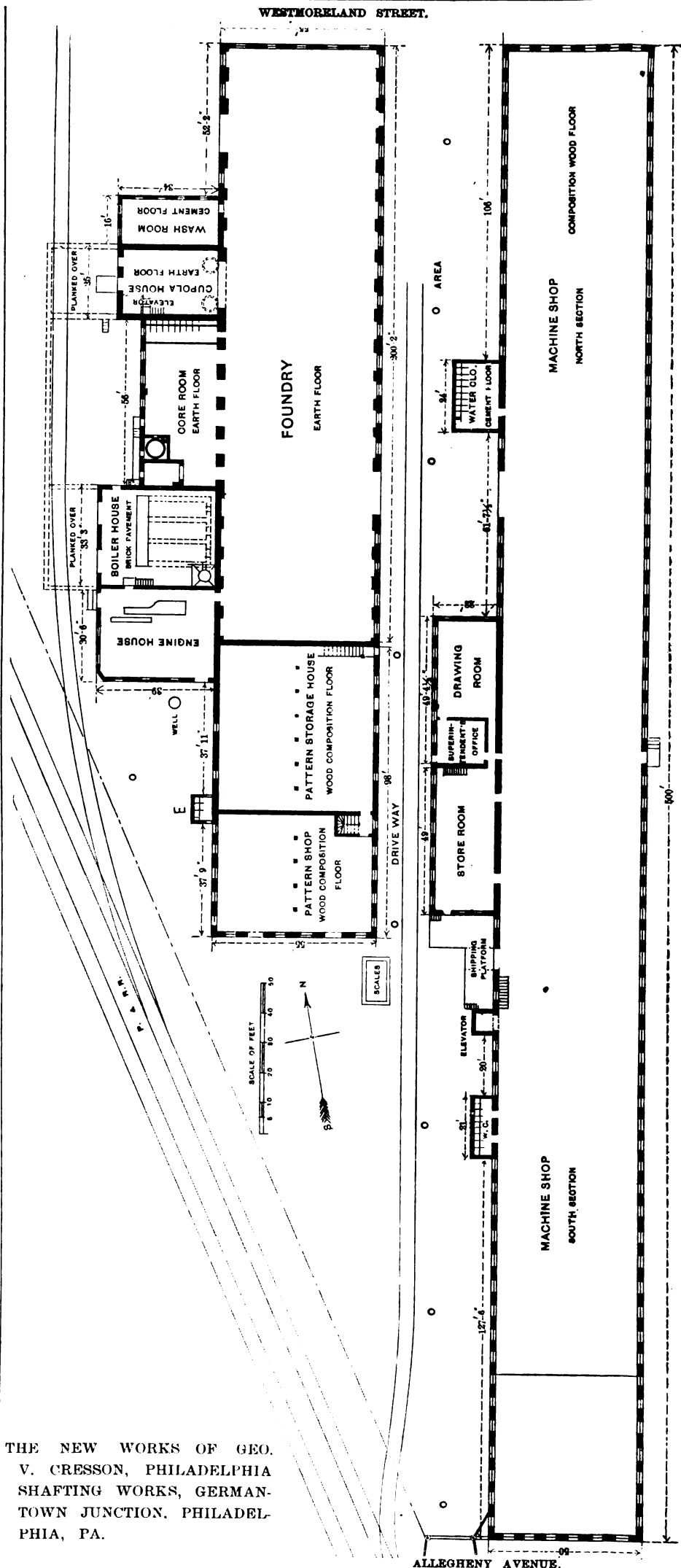
New Works of George V. Cresson.

Twenty-five years' experience in the manufacture of any particular article should result in establishing sound, practical ideas regarding the machinery to be employed and the accommodations necessary, in order that the work may be carried on to the best advantage. The factory, of which we herewith show the ground plan, may be said to be the outgrowth of such a length of time spent in the making of shafting and all its appurtenances. The factory is located at Germantown Junction, a suburb of Philadelphia, on the Philadelphia and Reading Railroad. Direct and quick communication with the coal and iron regions and convenient shipping facilities are thus obtained. Three principal considerations governed the laying-out of the works: 1, The economical handling of raw material; 2, The economical handling of unmanufactured raw material, and 3, The economical handling of the finished material.

By the first, we mean those materials which form component parts of the completed product, such as pig iron and shafting in the rough. By the second, we mean the handling of castings and shafting. By the third, the loading of the finished product on the car or wagon for delivery. These most essential features were secured in a simple and effective way. The time-worn fact that it consumes time and costs money to move heavy weights was kept well in view, as was also the fact that, if a heavy weight must be moved, it is cheaper and quicker to move it on a level than either up or down. The buildings were, therefore, so planned as to bring all work upon the same floor level, with the single exception of the pattern shop, which is more than one story high. Distance was reduced as much as possible, and it was arranged so that very heavy work could be done in that end of the shop nearest the foundry, the weights gradually lessening toward the far end, where only comparatively light articles could be finished.

Two tracks connect with the railroad, one west of the foundry and the other between the foundry and machine shop. All supplies for the cupola are unloaded at the door and raised by means of an elevator. The cupola-house is 25 x 34 feet. North of this house is a washroom 16 x 34 feet made with a cement floor which slopes toward the center where a drain is provided. Upon the opposite side of the house are the corerom and ovens. The boiler and engine-house, south of the corerom, measures 63 x 39 feet. East of these is the foundry, 55 x 200 feet and 35 feet high, which is lighted by a double row of wide windows. The walls of the foundry are buttressed upon the inside to form seats for the tracks of a traveling crane which may be moved to any desired spot. The pattern shop and storage-room occupy 76 feet of the southern end of this building. The machine shop is a single room 50 feet wide and 500 feet long, the walls being 16 feet high. At the western side are the drafting and store rooms and the superintendent's office, the latter being about in the center of the works, so that he is within quick call. The shop is lighted on all four sides by long windows extending nearly to the roof and placed 8 feet, centers to centers. The southern end of the shop is fitted up as general offices.

The ground upon which the buildings are located slopes slightly from north to south. This afforded a most excellent floor for the foundry and permitted the laying of the northern part of the machine shop floor, where all the heavy machinery is placed, directly upon an earth foundation. It also furnished a lower story under the southern end of each building. Ample window spaces, aided by a plenti-



THE NEW WORKS OF GEO. V. CRESSON, PHILADELPHIA SHAFTING WORKS, GERMAN-TOWN JUNCTION, PHILADELPHIA, PA.

ful supply of whitewash, which it is proposed to frequently renew, thoroughly light all of the rooms. What might be termed general illumination, for night work, is obtained from arc lights, incandescent lamps being used at the machines. The buildings are heated by the exhaust steam from the engine, all danger of back pressure being relieved by means of a pump, which delivers the water of condensation—flowing by gravity to the pump from all the radiators—to the boilers. Power is transmitted from the engine to each of the shops by 1½-in. manila rope belting. This method of transmission was adopted mainly because of the great distance to the driving shaft of the machine shop and the sharp turns in the line. The belt passes through a tunnel under the roadway separating the two buildings. All possible precautions, both as regards materials entering into the construction and apparatus, have been taken to guard against fire. All posts are of yellow pine. The core oven rooms, cupola and boiler-house are built entirely of iron and brick

fore which the cases were first tried, ordered a preliminary injunction to be served on the companies, holding that where valuable franchises had been granted by the commonwealth or municipality, and where there was virtually no competition, the people from whom the franchises were received had recourse to the courts through proceedings in equity. As soon as this decision was announced, the gas companies immediately carried the cases to the Supreme Court, which has reversed the decision in both cases, and has also dissolved the injunction. As the matter now stands, it would seem that the gas companies have the right to charge whatever they see fit for their fuel, and if the people do not wish to pay these prices, they can return to the use of coal.

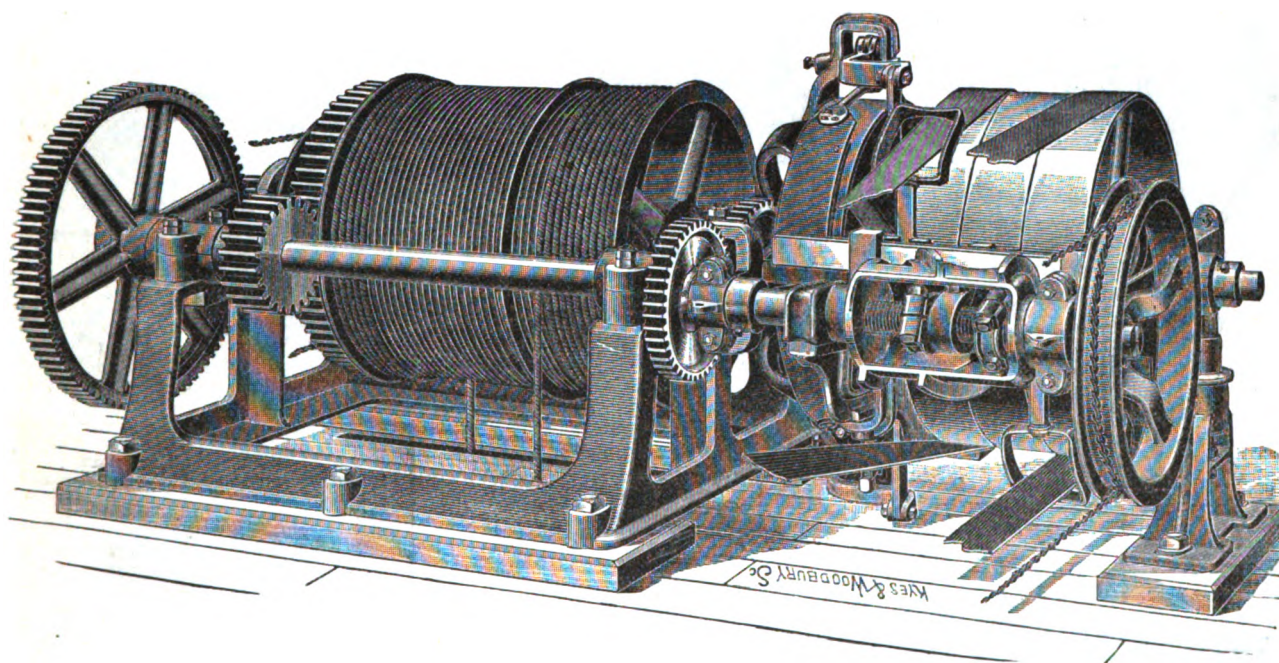
Geared Hoist for Elevators.

The geared hoist for passenger or freight elevator service, which is illustrated herewith, has several new features.

Manufactures in Japanese Prisons.

A visitor to a Japanese prison in Tokio thus recounts, in the *Pottery Gazette* (London), a portion of his experiences:

We visited a workshop where *jirikishas* were being made, then one where umbrella handles were elaborately carved, then one where every kind of pottery, from the rough porous bottle and jar to the egg-shell teacup, was rolling from a dozen potters' wheels, and then came the great surprise. Two days previous I had visited the house of the most famous maker in Japan of the exquisite *cloisonne* ware—the enamel in inlaid metal work upon copper—who rivals in everlasting materials the brush of Turner with his pigments and the pencil of Alma Tadema with his strips of metal. And I had stood for an hour behind him and his pupils, marveling that the human eye could become so accurate, and the human hand so steady, and the human heart so patient. Yet I give my word that here in the prison at Ishikawa



GEARED HOIST FOR PASSENGER OR FREIGHT ELEVATOR. BUILT BY MORSE, WILLIAMS & COMPANY, PHILADELPHIA, PA.

masonry. Water under a sufficient head for fire purposes can be obtained from the city's mains. Water for general use is obtained from an artesian well, sunk just south of the pattern shop.

The Price of Natural Gas.

On Monday, the 7th inst., the Supreme Court of Pennsylvania, in session at Philadelphia, announced a decision in the suit of the consumers of natural gas in Allegheny City against the Allegheny Heating Company, and also in the action brought by the citizens of Servickley against the Ohio Valley Natural Gas Company, both of which were to restrain the companies from advancing the charges made for natural gas. The main point at issue in the two cases mentioned was as to the right of the courts at Pittsburgh to determine the rates which should be charged by the companies for natural gas. It was claimed, on the part of the plaintiffs in the suits, that when the question of excessive charges was raised, the courts had the right to hear the evidence, and if said charges fixed by the gas company were deemed excessive, to establish new rates. The local court at Pittsburgh, be-

Both pinion and gears are cut by the most approved methods, thereby securing greater accuracy than has been attempted heretofore in the same class of machinery, and giving a smooth and noiseless motion at a high speed. It is provided with a centrifugal governor that acts in case the belts break in descending; has slack cable device that stops the car instantly and applies the brake, keeping the cables taut on the drum when the car is obstructed in its descent. It is also provided with an automatic drop forge, wrought iron stop device, which prevents breakage. The machine is right or left hand, and can be placed in any position desired, as the bolts will run at any angle. The pulleys are self-oiling, requiring attention only once in six months. It is manufactured by Morse, Williams & Co., Philadelphia, New York and Boston, who also manufacture hydraulic, worm-gear and hand-power elevators.

Several gentlemen interested in the prosperity of Pittsburgh seriously propose to increase the volume of the Allegheny River by constructing a canal to Niagara Falls at a cost of \$12,000,000, and obtaining water sufficient for the purposes of navigation.

sat not six but 60 men, common thieves and burglars and peace breakers, who knew no more about *cloisonne* before they were sentenced than a Hindoo knows about skates, doing just the same thing—cutting by eye-measurement only the tiny strips of copper to make the outline of a bird's beak, or the shading of his wing, or the articulations of his toe, sticking these upon the rounded surface of the copper vase, filling up the interstices with pigment, coat upon coat, and fixing and filing and polishing it until the finished work was so true and so delicate and so beautiful that nothing except an occasional greater dignity and breadth of design marked the art of the freeman from that of the convict. Fancy the attempt to teach such a thing at Pentonville or Dartmoor or Sing Sing! When our criminal reaches his prison home in Tokio he is taught to do that at which the limit of his natural faculties is reached. If he can make *cloisonne*, well and good; if not, perhaps he can carve wood or make pottery; if not these, then he can make fans or umbrellas or basket work. If he is not up to any of these, then he can make paper, or set type, or cast brass, or do carpentering. If the limit is still too high for him, down he

goes to the rice mill, and seesaws all day long upon a balanced beam, first raising the stone-weighted end, and then letting it down with a great flop into a mortar of rice. But if he cannot even accomplish this poor task regularly, he is given a hammer, to break stones with the 29 men out of 2000 who could not learn anything else.

Ore Concentration at Brewsters.

The new concentrating plant of the Tilly Foster mine of the Lackawanna Coal and Iron Company, at Brewsters, N. Y., has been running in an experimental way for some time. The plant itself consists of three 100 horse-power boilers and a 65 horse-power Beckett & MacDowell engine. The lean rock, as it comes from the famous

posit is going on rapidly. The original contract called for an outlay of about \$290,000, but it is believed now that it will not go beyond \$225,000.

The Rader Case.

Judge McPherson has handed down an opinion in the suit of Charles J. M. Rader vs. W. Kaufman & Co. He found the facts as follows:

1. In September, 1883, the plaintiff, who was then employed at Phoenixville, Pa., as a blast furnace manager, was asked by the defendants to accept a similar position at their furnaces, at Sheridan, Pa. Some negotiation followed, resulting in a parol contract, of which these are the substantial terms:

The plaintiff agreed to accept the position and discharge the duties of manager at Sheridan. In consideration the defendants agreed

Improved Rotating and Exhaust Fans.

Rotating fans, designed to create a circulation of air in rooms, are usually mounted in a triangular frame of a more or less ornamental character. The sides of the frame are generally cast separately and then rigidly united to hubs through which the spindle passes. This formed a most clumsy article to handle, one that occupied much space when stored, and one that required boxing when shipped. The most serious objection was the danger of the frame breaking and the difficulty of making repairs. It is claimed that all of these drawbacks have been eliminated in the frame illustrated, which has been in-

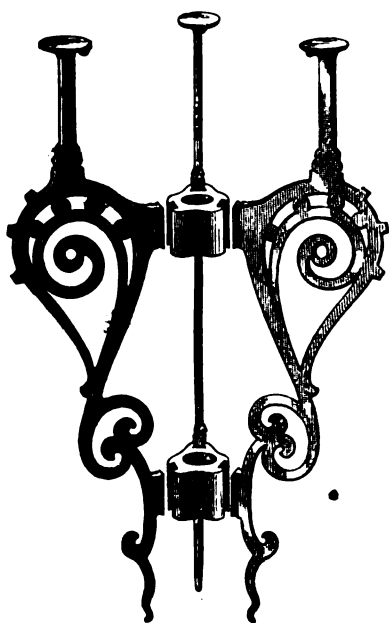


Fig. 1.

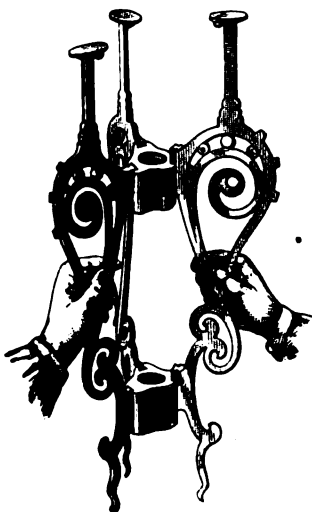


Fig. 2.

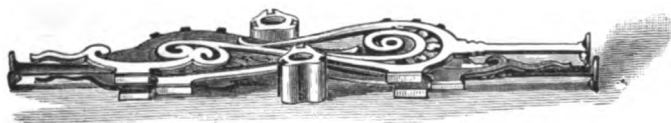


Fig. 3.

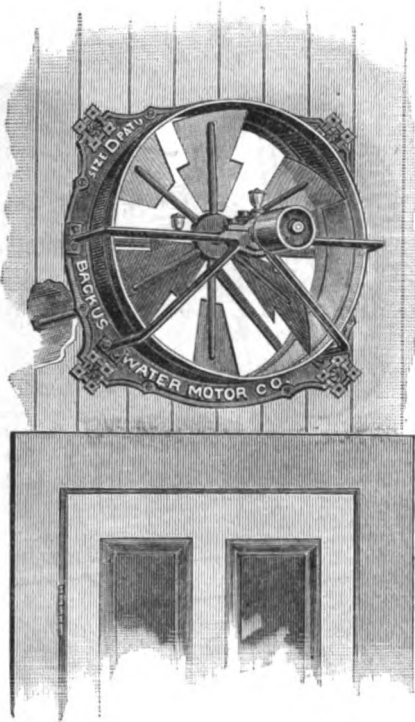


Fig. 4.

IMPROVED ROTATING AND EXHAUST FANS, MADE BY THE BACKUS WATER MOTOR COMPANY, OF NEWARK, N. J.

mine, is passed through a 15 x 20 Blake crusher, from which it is delivered to two Ball stamps, used for the first time for this purpose east of the Allegheny Mountains. The crushed ore goes to five Conkling jigs. The plant has not yet in its results gone beyond the stage of trial, and some additions are now being made. It is of considerable interest, because it represents a radical departure in some respects from the principles upheld as correct by the majority of those who have given attention to iron ore concentration. It is, we repeat, too early to form a judgment of the merits of the general design and the advantages of individual parts of the plant. We noted an interesting little "kink" in the engine-room, which is the idea of Captain Cosgriff, the manager at the mine. He has put up three oil receivers into which he conducts exhaust steam, thus having the oil warmed before it is used for lubrication. The plan is very simple, inexpensive, and is pronounced very effective.

At the Tilly Foster mine the great work of uncovering the whole roof of the de-

to employ him for five years, to furnish him with a house, to pay him 1% per cent. per ton of the selling price of iron at the furnace while iron was being made at both furnaces or at either; to pay him \$2500 per year if both furnaces should be out of blast at the same time, and, if he should be discharged without cause during the five years, to pay him \$3000 in addition to the other sums above stated.

2. The plaintiff, in fulfillment of this contract, went to Sheridan toward the end of October, 1883, and remained there as manager until about September 18, 1885, when he was discharged by the defendants. During this period the plaintiff performed the duties of manager, as required by his contract, giving the necessary care and attention to the work, and obeying the defendants' orders as to the proportions of iron ore and mill cinder to be used in the furnace.

3. There remains unpaid to him the sum of \$1455.82, being a balance of 1% per cent. per ton upon the selling price of iron at the furnace. The sum of \$3000, above referred to, is also unpaid.

The court decided that the plaintiff was entitled to recover \$5324.82.

In their East African policy Germany and England are believed to be thoroughly in accord.

roduced recently by the Backus Water Motor Company, of Newark, N. J. The sides are cast with taper dovetails adapted to fit dovetails formed in the Babbitt metal hubs, which are so cast as to make a perfect bearing for the shaft. The manner of joining the sides and hubs is plainly shown in Figs. 1 and 2. No screws or rivets are needed to keep the parts in place. When necessary, the frame can be taken apart and arranged as in Fig. 3 for storing or shipping.

The new feature of the exhaust fan, Fig. 4, is found in the shape of the blades. The inner portions of the alternating blades are cut away, while the other blades extend to the hub. The engraving shows the shape of the blades. Careful tests made with this exhauster prove that it delivers a full volume of air from hub to periphery. The loss of power resulting from back lash is eliminated. This allows of its being run at an unusual rate of speed and enables it to deliver a greater quantity of air—using the same power—than fans which are troubled with the return current.

THE WEEK.

Retaliation has taken effect in Canada through a new customs order received from Washington, which prohibits any Canadian-built car passing Detroit without paying duties, if such cars are intended to ply between points in the United States. Both the Canadian Pacific and Grand Trunk folks say that the order will have no material affect upon them, as they both have plenty of American-built cars for the business of carrying freight from Eastern points in the United States through Canada to Chicago and Western points. They have only to fear the retaliation of the Dominion Government in preventing the American-built cars from passing through Canada, in which case it would be necessary to tranship all international freight at the boundary line.

Two trusted officers in the employ of the Pennsylvania Railroad Company are charged with selling steel rails and scrap to the Trenton Steel and Iron Works. The depredations extend over a period of three years and are said to amount to \$8000.

The Assembly ceiling, at Albany, for which the people of the State have paid \$227,000, seems to be a sham, and an investigation will be necessary. While the bill was pending before the Legislature it was understood that the new ceiling should be of carved oak. After the bill had been signed and work was begun the use of papier-maché was discussed. When the work was finished the startling discovery was made that the panels were not composed of quartered oak nor of papier-maché, but of plaster of paris run into molds with a backing of burlap.

The Commissioner of Agriculture in Washington states that the attempt to manufacture beet sugar in Maine is a failure, owing to the cost of culture and the necessity of siloing the beets in winter, but the industry promises to become important in some other localities.

A bill amending the contract labor law has been reported in Congress by the Ford Investigation Committee which has a chance of passing the House. No vessel is allowed to carry more than one immigrant to each registered ton, which is about half the number now permitted to be carried, and the head tax is to be raised to \$5, and collected upon all alien passengers by land or by water, except consular and diplomatic representatives or agents.

The New York Chamber of Commerce, after a full discussion, voted 41 to 3 in favor of an up-town location for the proposed customs buildings, and a special committee will report to the Chamber at the next meeting in reference to further action.

A resolution before the State Trades Assembly Convention, in Albany, urged the passage of a law curtailing the use of labor-saving machines in factories. By abolishing machines altogether it might be possible to satisfy the demands of some of these professional agitators.

A proposition to turn the waters of Niagara River into the Allegheny came to naught last week, when the engineer reported that if a canal was cut through as proposed there would be a rush of water in the opposite direction. The Allegheny would be drained, and not filled.

One of the Northwestern railroads runs vestibuled trains heated by steam from the engine, and illuminated by electricity from a dynamo in the baggage car. The sleeping cars have an incandescent burner in every section.

A bill introduced into the Legislature of Pennsylvania provides that it shall be unlawful for the representatives of mining or railroad companies to meet or combine for

the purpose of regulating the traffic, cost of production or the transportation or price of anthracite coal, or for the controlling of the rates of wages to be paid to their employees or persons employed in the mining, transportation or production of anthracite coal, or for the purpose of controlling the number of days and hours of work to be performed by said employees.

At the annual meeting of the Franklin Institute, held in Philadelphia last week, J. C. Bayles, of New York, described a new machine for manufacturing spiral weld tubing, and exhibited specimens of the product. He said the tubes were manufactured from steel, and were cheaper and better than iron, and stronger than tubing made by other processes. For the purposes of conveying petroleum, natural gas, steam and water, for all of which it is at present in use, the inventor claimed for it special advantages. After Mr. Bayles had concluded, Mr. Wiegand moved that the invention be referred to the Committee on Sciences and Arts for examination and award, which was agreed to.

The Franklin Institute, of Philadelphia, reports a membership of 2081, and the library contains 31,762 volumes. The total receipts for the year were \$30,077, and the expenditures \$18,660. The officers are: President, Joseph M. Wilson; vice-president, Frederick Graff; secretary, Wm. H. Wahl; treasurer, Samuel Sartain; auditor, Wm. A. Cheyney; managers, George V. Cresson, Persifor Frazer, Edwin J. Houston, Enoch Lewis, John Lucas, Samuel P. Sadtler, Wm. H. Thorne, John J. Weaver.

Mr. Bland introduced in the House a bill providing for the free coinage of silver, and recognizing the standard silver dollar as a standard of value on the same basis as gold. He favored a report on the bill as a preliminary to work in the next Congress. As soon as the tariff is out of the way, he said, the silver question is coming up again.

Detroit College has decided to have new buildings, to cost \$200,000.

The Postmaster General has concluded the parcel post convention with the United States of Colombia, similar to that recently concluded with Mexico.

For more than a quarter of a century the "proposed" bridge or tunnel for crossing the English Channel has formed a periodically prominent topic. It is now stated that Messrs. Schneider and Hersent have completed plans and specifications for the bridge they propose to erect from a point near Cape Griznez, on the French coast, to Folkestone, a distance of 87 km. The bridge is to be 30 m. wide. The cost is estimated as follows: Foundations and masonry, 360,000,000 francs; superstructure, 900,000,000 francs. Of course the business that would probably flow over the bridge has been carefully tabulated.

Australian advices via San Francisco pronounce the Melbourne Exhibition a failure, a very large sum having been sunk in the undertaking; consequently the buildings will be closed at the end of this month, instead of remaining open until June next, as was intended. So great was the success of the World's Exhibition of 1872 that the buildings were enlarged to cover 30 acres, and all calculations were on a corresponding scale of increase, but vaulting ambition overleaped itself.

Increasing activity in shipbuilding is reported at all points on the lakes, stimulated by the handsome profits of last year. Sales are reported almost daily of steamers still on the stocks at high prices, and of others at prices well above their Lloyds valuation. The Majestic, the largest wooden carrier on the lakes, sold last week at Bay City for \$150,000 before she

had turned a wheel. There is a strong disposition to build vessels of the largest carrying capacity, at a cost ranging as high as \$275,000 for a single steamer, but the limited depth of water is an impediment not easily overcome. Last year a round 100,000 tons measurement, nearly all being steamers and of an average carrying capacity of about 2500 tons, was turned out on the lakes, and there are now 65 vessels on the stocks, with a total carrying capacity still greater. Of these 12 are steel and four are composite.

A three days' sale by auction of the Great Eastern and her fittings has taken place at Liverpool. The catalogue contained 895 lots. The hull and fittings realized £43,000, the copper bringing £2960; the gun metal, £4480; brass, £3980; lead, £4185; outer iron plates, £12,500; beams, &c., £12,280, and anchors about £300. The machinery brought about £10,000 in addition, making a total of more than £50,000. The breaking up of the steamer will occupy about one year.

Isaac Bell, Jr., late American Minister to the Hague, died on Sunday morning at St. Luke's Hospital. Mr. Bell was born in New York about 40 years ago. He was the eldest son of Isaac Bell, for many years a prominent Wall street shipping merchant, and later president of the Old Dominion Steamship Company.

One of the electric illuminating companies in this city has been granted permission by the Board of Electric Control to lay an experimental cable for the purpose of testing the subway system. The result ought to be conclusive.

A proposed bridge across Detroit River excites the fierce hostility of many who are interested in lake navigation. It is charged that railroads want a bridge rather than a tunnel at the point designated, because they would economize at the expense of the shipping interest. The Buffalo *Commercial Advertiser* says: "There is not a channel in the world traversed by so much commerce as this one. The great and rapidly increasing trade of Lake Superior nearly all comes down Detroit River, as does the entire commerce of Lake Michigan and the lumber trade of Lake Huron and the Georgian Bay. Much of this business is done by means of great tows, in which from three to six vessels are connected together and drawn by a powerful steamer. It is hard enough to navigate the rivers as they are now; frequent collisions and groundings take place. The erecting of bridge abutments in the channel would increase the dangers a hundred-fold." A tunnel, it is declared, is entirely practicable.

Up to the present time at least the Hudson River is as free from ice as in summer, freight barges running to Poughkeepsie without obstruction, or even as far up as Rondout.

American window glass manufacturers are struggling against excessive production and are much perplexed on account of foreign competition. The president of the Manufacturers' Association, Frank L. Bodine, of Philadelphia, states that from 1880 to 1888 there was an increase of from 700 to over 1200 pots in actual operation. The product of the blast of last year is 200,000 boxes greater than that of the previous year. Of course the consumption increased also, but not to keep pace with the production. The consumption of both the American and the imported article was very large last year, but the prices were ruinous on account of the great output and the immense importations. The increase of importations last year over the previous year was 120,000 boxes, and the total exportations amounted to more than 750,000 boxes,

which is 37 per cent. of the entire consumption. The stock in the hands of the American manufacturers is 550,000 boxes, as against 350,000 boxes for the previous year.

Secretary Fairchild on Saturday transmitted to the Senate a copy of the manuscript report of frauds in sugar at New York and Philadelphia, dated November 1, 1887, which was submitted by Special Treasury Employee T. Aubrey Bryne. He presents a table showing the loss to the revenue on sugar imports at New York and Philadelphia from June 1, 1883, to June, 1886, by reason of the lower rate of duty paid at New York and Philadelphia than at Boston. This loss aggregates \$4,045,800. He says "the charge of the Boston customs officers and merchants, that Philadelphia is two degrees invariably and sometimes three degrees below the Boston rates as per classification stands reasonably proved." Mr. Bryne suggests the establishment of a permanent "sugar statistical bureau" at the ports of New York, Boston and Philadelphia.

A desolating drought again threatens the province of Ceara, in Brazil, and the Government has adopted energetic measures to mitigate its severity. A great reservoir is contemplated by building a dam 74 feet high.

Three new revenue cutters are to be built for the Government. Pusey, Jones & Co., of Wilmington, secured a contract for one at \$74,000, and bids for another will be opened in a few days.

Another alarming subway explosion has taken place, this time in Nassau street near the Sub-Treasury. This is the third which has occurred during the past few months, and all within half a mile of each other. This last was unlike any of the others. In each of those cases there were electric light or telegraph wires in the conduit, which were supposed to have ignited gases in the manholes. But the Nassau street subway has never yet been used. Nobody suspects enemies of the subway system of being concerned in an act of vandalism.

The House passed the Omnibus bill providing for the admission of South Dakota, Montana, Washington and New Mexico, and it is expected to go through the Senate.

A rupture between Mr. Edison, the famous inventor, and his late legal adviser is said to have originated from the fact that in effecting the sale of the phonograph patents to a Pittsburgh capitalist the sum of \$250,000 was not accounted for, this being in excess of \$500,000 paid over to Mr. Edison, who appears not to have been informed respecting the details of the transaction. The inventor is reported as saying "that he was perfectly satisfied with the price his patent brought, but would have been glad to get the other \$250,000." It was not his intention to pursue the subject any further.

Senator Allison declares that there are more extensive deposits of tin in this country than in all the rest of the world, and that Dakota alone could supply the demands of the world.

The completed naval appropriation bill, in addition to the appropriation of \$450,000 for an additional cruiser of the Vesuvius type, and \$1,500,000 for a cruising armored monitor on the Thomas plan, provides \$10,340,000 for continuing work on the new vessels already authorized by Congress.

Mayor Grant, referring to a bill now before the Legislature of this State, says there should be no delay in putting up a public building to replace the Register's

Office, General Sessions Building and engine-house, in the northeast corner of the City Hall Park, that the records might be safely kept and the various city departments withdrawn from rented quarters. Mr. Grant hoped that the bill would become a law. A fire-proof building for the preservation of the city records is demanded by urgent considerations.

The Lehigh Valley has definitely decided to abandon the Morris Canal. No boats will be run up it after this year, and probably none will be started out this year. Arrangements are about completed with the city of Newark for supplying it with water. The canal is fed from Lake Hopatcong and Greenwood Lake. The railroad agrees to furnish 50,000,000 gallons of water daily, and to sell the plant for \$6,000,000.

The January crop report of Michigan, issued by the Secretary of State, is devoted to the cost of producing wheat in that State during the past five years. Deducting the value of straw and rental values, as applied to plant and buildings, and dividing by the average yield per acre, the cost of producing 1 bushel of the cereal in Southern Michigan last year was 66 cents; in Central Michigan, 65 cents; in Northern Michigan, 57½ cents; average, 64 cents; the average cost per acre for five years in the State at large was 64½ cents.

The *Industrial Journal*, Bangor, says 1888 was a better shipbuilding year in Maine than 1887, while 1889 is likely to show still better. The activity has been occasioned by the demands of the coasting trade. Scarcity of tonnage and high rates have made a harvest for shipbuilders. In 1888 Maine turned out 54 vessels, aggregating 16,086.48 tons, as compared with 41 vessels, aggregating 17,454.75 tons, in 1887. The vessels built in 1888 have thus averaged much smaller.

In a recent work on the British farmer and his competitors Mr. W. E. Bear makes a suggestion which will startle Americans. His argument is that unless the area of wheat growing is greatly extended in the United States we must cease to be a wheat exporting country before the close of the present century. The statistics by which this view is supported are the average annual consumption of wheat in the United States during the five years ending with 1884, which was 324,000,000 bushels, and the average export, which was 140,000,000 bushels.

An ocean cable is about to be laid between Coatzaacoalco, in Mexico, and Galveston, duplicating the Gulf system and insuring ready communication with all important places in South America, both on the Atlantic and Pacific coasts.

A trust to contro! prison-made brushes has been formed in Columbus, Ohio, and includes in the sphere of its operations the large works in Elmira, N. Y.

Tank oil steamers are growing in favor. The Standard Company are about to contract for a steamer of 10,000 barrels capacity for the coastwise trade, and two more, each of 30,000 barrels capacity, are building in the Clyde for the Transatlantic trade, to be known respectively as the Manhattan and Bayonne. The latter will be considerably larger than any of the fleet of ten employed in the German trade.

The proposed Ottawa ship canal, designed to form an unbroken line of navigation from Montreal to Lake Huron by the improvement of the Ottawa and French rivers, will engage the attention of the Dominion Parliament during the coming session. According to the engineer's estimate, the distance between Montreal and Chicago would be shortened by 270 miles as compared with the St. Lawrence route.

Of the total distance between Montreal and Lake Huron, 352 miles are already good navigation, and it is considered practicable so to improve the remaining 79 miles as to convert the whole drain of waters into a first-class navigation for steam vessels. The cost of the work is estimated at \$12,000,000.

A sanguine believer in the Nicaragua canal says it is evident that the nineteenth century will not see the question of a ship canal across the American Isthmus solved by De Lessep's company, for, with a debt of \$400,000,000—interest and administration charges alone on which amount to about \$250,000 annually, and the almost proved impossibility of raising more money—there can be very little hope for the completion of the undertaking. But that the question will be solved, and that, too, in the present century, is abundantly testified by the finished surveys of the Nicaragua route, where nature is so propitious to the project, notably in furnishing the greater part of the way—almost five-sixths—and the activity of the company holding the concession from the Nicaraguan Government and organized for the prosecution of the work. This company has already deposited \$100,000 as the guarantee of good faith exacted by the Nicaraguan Government, and is now about to commence active operations.

A stubborn contest will take place in the New York Legislature over the question of employing convict labor. The members of that body are said to be impressed with the urgent necessity of a change, independent of questions relating to the respective advantages of the contract or State account systems. An Albany correspondent says: "'Honest labor,' of which so much has been heard, will not countenance a law that practically reduces 3500 fellow-men to the level of barbarians and imbeciles, and only such a law will be favored by demagogues. It is estimated that New York State spends \$25,000,000 a year on its convicts, jailbirds, tramps, paupers and lunatics, and, aside from any question of economy, common justice and fairness to taxpayers would seem to indicate that some fair equivalent should be received from those whom this enormous sum benefits. State prisons should certainly be made self-supporting, and can be made so without reducing the wages of honest workmen one dollar a year."

Examples of mercantile honor in these alleged degenerate days contrast pleasingly with too frequent instances of chicanery and downright fraud lately brought to public notice. Not long ago the discovery was made that even mortgages were open to suspicion as evidence of security in real estate transactions, in consequence of the use of fraudulent signatures. It was ascertained that a mortgage clerk, intrusted with the business of one of the legal firms in New York enjoying the highest reputation, was in collusion with a well-known notary in swindling operations of the first magnitude. The shock sustained in business circles was soon alleviated by the announcement that the law firm in question had instantly made good the losses, amounting to hundreds of thousands of dollars, sustained by its customers by giving bank checks equal to the deficit. Another case in point arises in the experience of the New York Produce Exchange. The guarantee fund of that institution having suffered heavily from the recent mortgage forgeries of Wm. R. Foster, Jr., the father of the faithless attorney presents the fund with \$50,000 for the purpose of reducing the deficiency, while as yet the criminal is a fugitive from justice. The trustees of the fund gracefully recognize the motives that inspire this action. Mercantile honor does not exist merely as a sentiment of the past.

MANUFACTURING.

Iron and Steel.

Messrs. Charles Huston & Sons, Lukens Rolling Mills, Coatesville, Pa., have placed contracts for a new steel plate mill, which will be larger than any one in the country. The rolls will be 120 inches long and 34 inches in diameter, to be made by the A. Garrison Foundry Company, of Pittsburgh, while the train will be made by MacIntosh, Hemphill & Co. It is to have automatic hydraulic tables, and everything will be done to make it the most complete in the country. The train will be driven by a 36 x 60 Corliss engine, to be specially built by Robert Wetherill & Co., of Chester, Pa. It will have a 50-ton fly-wheel, and the steel shaft will be 18 inches in diameter in the journals.

The Oxford Iron Works, manufacturers of cut nails, resumed operations on the 21st inst., after a suspension of several weeks.

No. 5 furnace of the Crane Iron Company at Catasauqua, Pa., has been blown in, after being relined and repaired, and No. 6 stack has been blown out for repairs. Five furnaces of this firm are now in operation.

The trustees for the creditors of Brown, Bonnell & Co., of Youngstown, have commenced proceedings on behalf of 44 creditors to obtain judgments aggregating \$18,000. The Menominee Mining Company have also brought suit for \$2889 due on a consignment of iron ore.

A special dispatch from Sharon, Pa., under date of the 15th, says: "The Wheatland Rolling Mill, which for a year has been undergoing repairs, and been fitted up with new hydraulic machinery for the manufacture of pipe iron, was started up this afternoon preparatory to resuming operations permanently. The hydraulic machinery is unique. It is the invention of a Pittsburgher, Mr. Mattocks. Rolling of iron by its use is made easier, the labor amounting to the mere controlling of several levers. Large pieces of iron are placed on a bed when taken from the furnace, and by the ingenious mechanism are rolled to different sizes, elevated and depressed, the bed having several motions all worked by levers. A Pittsburgh company, composed principally of the Wood's heirs, own the patent. T. S. B. Wood is superintendent."

The *Bulletin* of the American Iron and Steel Association reports that No. 1 Furnace of the Andover Iron Company, at Phillipsburg, N. J., which made such a good record one week early in December, made a still better record for the week ended December 29. The last week it produced 824 gross tons of No. 2 X, No. 2 and gray forge pig iron on a consumption of 2220 pounds of fuel to the gross ton of iron made. This is certainly remarkably good work, and reflects great credit on the management of Mr. Joseph C. Kent, the superintendent. The fuel used was three-fourths anthracite coal and only one-fourth coke. The size of the stack is 17 x 75 feet. Compared with the previously noticed week in December the last week's work shows a gain of 24 tons, and a saving in fuel of 41 pounds per ton. We do not know to what extent the use of Lake Superior ore has influenced the splendid results which the *Bulletin* announces.

A dispatch from Phillipsburg, N. J., dated January 7, says: "The old blast furnace at the Oxford Iron Works, at Oxford, is being torn down to make room for a large wheelwright and blacksmith shop. The furnace is one of Oxford's oldest

relics, it having been erected a century ago. It is the oldest stack in New Jersey and, it is claimed, rendered services in manufacturing ammunition for the Revolutionary war. Many of the people around Oxford are securing bricks, &c., that come from the stack as relics." Oxford Furnace was built by Jonathan Robeson in 1742. It has divided with Cornwall Furnace, in Lebanon County, Pa., the honor of being the oldest furnace yet standing in the United States.

At Pittsburgh last week Nimick & Co. entered suit against James Marshall, Jr., doing business as James Marshall & Co., for \$10,434.40 with interest from May 15, 1893. The suit was for the price of pig iron sold to Marshall, who was an iron broker.

Notice has been posted at the steel plant of the Pottstown Iron Company, at Pottstown, Pa., that unless business improves the works would be shut down for an indefinite period.

The Hamburg Rolling Mill, at Hamburg, Berks County, Pa., owned by the Philadelphia and Reading Coal and Iron Company, has been leased to Mr. Walter Nevegold, of Philadelphia, from April 1, 1890. The mill has been idle for the last two or three years.

On the 1st inst. the name of the Johnston Steel Street Rail Company, of Johnstown, Pa., was changed to Johnson Company. This company last spring erected a new rolling mill at Johnstown for rolling street rails. White & McLure, iron and steel factors, are the Pittsburgh representatives of the company, and are located in the Peru Building in that city.

T. B. May has resigned his position as manager of the plant of the Standard Iron Company, at Bridgeport, Ohio, and will be succeeded by S. T. Williams, of Philadelphia.

D. W. C. Carroll, Limited, of Pittsburgh, are bidding on 15 miles of water-pipe for Colorado. The pipe is 36 inches in diameter, and made from No. 7 iron. The work amounts to \$62,000, and is to be completed in nine months.

James P. Witherow, the well-known engineer and contractor, of Pittsburgh, reports that his firm has a large amount of work in hand. At present he is building for the Chester Rolling Mills, at Chester, Pa., a Bessemer steel plant, which, when completed, will have a capacity of from 300 to 400 tons daily. The mill will make ship plates. Mr. Witherow has also contracted with the above firm for the erection of an additional blast furnace at Roanoke, Va. He is also engaged in the erection of a new blast furnace for the Jefferson Iron Works, at Steubenville, Ohio, and three new furnaces for the Bessemer Iron and Steel Company, at Bessemer, Ala. and also a new stack for Raney & Berger, at New Castle, Pa. He has just completed a new stack for the Junction Iron Company, at Mingo Junction, Ohio.

The new blast furnace of the New River Mineral Company at Ivanhoe, Va., was recently put in blast. The following are the dimensions of the furnace: Total height, 60 feet; bosh, 12 feet; hearth, 6 feet. It is equipped with two 60 x 16 feet Whitwell stoves, one 84 x 36 x 48 inch blowing engine, built by J. P. Witherow & Co., two batteries of Heine boilers, and an incline hoist. The limestone ores, peculiar to the Cripple Creek region, are mined less than a mile from the furnaces, and washed in the rear of the stock house by four double washers. These ores, together with an admixture of Potsdam ores, make a foundry iron of remarkable strength and fluidity. Pocahontas coke will be used.

Andrews Bros. & Co., proprietors of the Haselton Iron Works at Youngstown, Ohio, have recently bought about 10 acres of ground in the immediate vicinity of their plant, and will utilize it for switching purposes to meet the demands of their growing business. This company have in view some extensive improvements to be made at an early date on their Haselton blast furnace. The entire plant of the firm is being operated to its full capacity.

The Trinidad (Colorado) Rolling Mill is expected to begin work on the 1st of February. M. Lenhart is president, Henry Schneider is vice-president, and F. A. Marriott is superintendent of the company. They will make merchant iron from scrap.

The Montreal Rolling Mills Company, of Montreal, Canada, are making some extensive improvements to their plant, which will be completed about June next.

The rolling mill at Pomeroy, Meigs County, Ohio, is now in the hands of the Pomeroy National Bank, which is desirous of disposing of the property. The mill was idle in 1888, but is said to be in excellent condition.

The stock of the Bloomsburg Iron Company, at Bloomsburg, Pa., changed hands during 1888. The president of the company now is Mr. S. Knorr, and the secretary and treasurer is Mr. L. S. Wintersteen.

The Carbon Iron Company, of Pittsburgh, are operating their plant double turn and have plenty of work on hand for some time ahead. The steel manufactured by this firm is giving satisfaction to their customers, among whom are some of the most reliable people who use steel. All their product is made by the direct process, which has proved successful.

At a meeting of the stockholders of the Laughlin and Junction Steel Company, held in the office of the company, at Mingo Junction, Ohio, on Thursday, the 17th inst., the following named gentlemen were elected directors for the ensuing year: W. L. Glessner, Morgan L. Ott, Henry K. List, Manuel Gutman, H. M. Priest, David Gutman, W. W. Holloway and James W. Paxton. The board organized by re-electing W. L. Glessner and H. M. Priest general managers; W. L. Glessner, president; M. J. Urquhart, secretary and business manager, and W. H. Bradley, superintendent.

The Canton Steel Roofing Company, formerly the Canton Iron Roofing Company, of Canton, Ohio, who claim to have originally introduced steel roofing, have just completed their new plant, the dimensions of the main building being 100 x 200 feet, covered with their H. W. Smith patent steel roofing, and sided with pressed corrugated iron of their own manufacture. To their former extensive facilities they have added the latest improved machinery, also railroad switch, and increased their office and shop forces. The officers of the new company are: T. C. Snyder, president; Jas. H. Richardson, secretary; Clifford Holbrook, treasurer; T. C. Belding, superintendent. The capital stock is \$50,000.

A press dispatch announces that on the 19th the converting, blooming and rail mill of the Bessemer department of the Bethlehem Iron Company were closed for an indefinite period, and blast furnaces Nos. 1 and 4 will be blown out. In the ordnance department work will this week be commenced on 8 and 10 inch guns.

The Keystone Iron Works, at Reading, Pa., which have been idle for several weeks, resumed on the 21st, giving employment

to 90 hands. The foundries of the Reading Stove Works, where no work has been done for some weeks, are preparing to go into full operation.

Morris Sellers & Co., of Chicago, are about to make extensive improvements in their rolling mill to adapt it to the manipulation of steel. Their specialty is the Samson splice bar, which has up to this time been made exclusively of iron. As many of their customers are now calling for steel splice bars, the firm find it necessary to equip their mill to meet this demand. A 500-horse power engine has been ordered of the Aetna Machine Company, of Warren, Ohio, and a heavier train of rolls will be put up than any now in use in the mill. Steel blooms will be purchased. The firm will not abandon the use of iron, but will supply either iron or steel splice bars, as desired.

Machinery.

The Westinghouse Electric Company, of Pittsburgh, are now engaged in putting up an electric plant at Portland, Ore., where the generating station is 12 miles distant from the lamps, an electric feat which has never been accomplished by any electric company either in Europe or America. The greatest distances which so far have been covered are seven miles and four miles.

G. A. Crosby & Co., of Chicago, manufacturers of sheet-metal workers' machinery, have broken ground for a new factory to be located at 176 and 178 South Clinton street. The main building will be 140 feet deep by 40 feet wide. The first floor will be 160 feet deep, the extension being used for a blacksmith shop, one story high. The building will be four stories high, built of brick, with a pressed-brick front, substantial stone foundations, and a flat roof. The air-shaft on the side of the building will have iron pillars with large windows filling the intermediate space. It is expected that the building will be completed by May 1, when the firm will remove from their present quarters at 269 to 273 Randolph street.

The Chapman Valve Mfg. Company, Indian Orchard, Mass., favor us with a copy of their catalogue of Gate Valves and Fire Hydrants which they manufacture. The catalogue is gotten up in the shape of an engineer's pocket-book, the first 60 pages of which are devoted to illustrations and descriptions of the extensive variety of Valves made by this concern. The illustrations are exceptionally fine, and accompanying them are descriptive particulars and where necessary tables of sizes and styles are also given. What makes the catalogue of special value to the trade, however, is the collection of miscellaneous data and information with which over 150 pages are filled. This part of the book, which is called an engineering appendix, contains a large number of very valuable tables, such as squares, cubes, circumference of circles, specific gravities, weights, composition of alloys, contents of vessels, water pressure, steam tables, friction of water in pipes, dimensions of standard pipes, candle power, &c. In addition to the tables, very much other miscellaneous information is provided, but, which it would be impossible to summarize, even by name, in a brief notice of the book. Suffice it to say that it is of the nature of an engineering pocket-book, and has been very carefully compiled, so that the most useful information is brought together in the smallest possible space.

The Acme Machinery Company, of Cleveland, Ohio, are at present erecting a two-story brick machine shop, 50 x 120 feet; also a separate L, 32 x 40 feet, to connect the new shops with their present one. The lower story will be used for offices and toolroom, and the second story for stockroom, and the upper story for

drafting-room. The company started in business four years ago to manufacture the Acme bolt and screw cutter, employing six hands. At present they employ 54 outside the foundry.

On the 10th inst. the Aetna Machine Company, of Warren, Ohio, sold a 400 horse-power engine to the New Albany Forge and Rolling Mill Company, to drive a train of rolls in their rolling mill at New Albany, Ind.

The Lloyd-Booth Company, proprietors of the Falcon Foundry and Machine Works, at Youngstown, Ohio, are now building for Andrews Bros. & Co., of Youngstown, Ohio, one of their No. 1 lever shears for shearing car axles, the weight of which is 50,000 pounds. The Lloyd-Booth Company have recently added a roll-turning department to their plant, which is now well organized, and they are now prepared to design and finish rolls for all purposes. The company are operating their plant to its utmost capacity, and report trade very good for this season of the year.

William Tod & Co., of Youngstown, Ohio, are building a pair of blooming-mill engines for the new Bessemer plant of the Chester Rolling Mills, at Thurlow, Pa., of an entirely new design. The frames are more substantially braced than is usual in this class of engines, and the links are supported centrally. The cylinders are 30 inches in diameter by 48-inch stroke.

The Racine Hardware Mfg. Company, of Racine, Wis., under date of the 14th inst., write us as follows: "We are manufacturing oil-burning outfits from 1 to 50 horse-power, for both stationary and marine purposes. One of our 30 feet 6 feet beam yachts, with a 6 horse-power oil-burning outfit, very compact, weighing but 1200 pounds, and occupying floor space of but 27 x 48 inches, made 12 miles per hour on Oconomowoc Lake, Wis."

The Stiles & Parker Press Company, Middletown, Conn., makers of presses, dies, &c., have been obliged to erect another addition to their works. The large number of orders which they have lately received necessitate this extra amount of room.

Goulds & Austin, 167 and 169 Lake street, Chicago, have issued a circular, under date of January 7, announcing that a corporation named Goulds, Austin & Caldwell Company will succeed them. While the business of the old concern will be taken over by the new company, the management will be unchanged, except for the addition of Robert W. Caldwell, a gentleman of large experience and unquestioned ability. Mr. Caldwell was formerly in business in Cincinnati.

The new Gaskill pumping engine of the Buffalo Water-Works, which was started the 12th, has a capacity of 20,000,000 gallons per day. It is of the compound condensing type, with a stroke of 48 inches. The steam cylinders are 34 and 72 inches in diameter, and the pump 36 inches. The fly-wheel is 30 feet in diameter and weighs 30 tons. It was built by the Holly Mfg. Company, of Lockport, and cost, with four 200 horse-power boilers, \$94,250. A duplicate has been contracted for, to cost about \$85,000.

Rankin & Fritch Foundry and Machine Company, St. Louis, Mo., have placed in their erecting shops a new 15-ton crane. They are very busy and report some heavy sales, and are compelled to run double turn.

Hardware.

Among the certificates of incorporation filed with the Secretary of State, at Columbus, Ohio, January 7, was that of the W. G. Avery Mfg. Company, Cleveland, Ohio; capital stock, \$30,000, the

incorporators being W. G. Avery, S. P. Churchill, George W. Avery, Joseph A. Osborne and B. G. Tremaine.

It is reported that a company is being formed at Lynchburg, Va., under the name of the Lynchburg Wire Picket Fence Company, for the manufacture of wire picket fence.

E. T. Fraim, Keystone Lock Works, Lancaster, Pa., who was recently burnt out, started up again in full on 15th inst., and is now prepared to fill all orders promptly, as heretofore.

The proprietors of the Ohio Lantern Works, at Findlay, Ohio, have decided to remove the plant to Tiffin, Ohio. A. L. Baron, the head of the enterprise, states that a failure of Findlay to comply with its contract relative to free natural gas fuel caused him to remove. The works will employ 75 hands and will begin operations April 1.

It is stated that a large plant for the manufacture of three-cornered wire nails will be established at New Castle, Pa., at an early date. The company which proposes to engage in the manufacture of these nails is known as the Three-Cornered Wire Nail Company, and has its headquarters at Pittsburgh. It is composed of J. C. Williams, William Taylor and other capitalists of that city. Mr. Taylor is the patentee and inventor of the machine for making those nails, and spent several days in New Castle recently, looking at several sites which the citizens of that place agreed to donate to the company if they would consent to locate there. A proposition was made to the company, which is now under consideration, and it is expected that within the next few days some definite action will be taken by the parties interested looking to the erection of the plant.

We are informed that the Mail City Lantern Company, of Wheeling, W. Va., contemplate making some extensive improvements to their plant located on Water street in the above-named city at an early date. As soon as the present stock is worked up a fourth story will be added to their building. A steam engine will also be put in, the office removed from the first to the second floor, and all the heavy machinery will be set up on the first floor. The present third story is one that has been added to the building since the company occupied it. The demand for the lanterns turned out by this firm, which have acquired an excellent reputation, has become so large that additional facilities for their manufacture have become a necessity. The proposed improvements will be completed at the earliest date possible and when finished the firm will have an exceptionally well-appointed establishment.

Miscellaneous.

The Lehigh Car Mfg. Company, of Stemton, Pa., recently shipped a lot of new cars to the island of Cuba for use in transporting iron ore from the mines of the Jaragua Iron Company to the seashore. The works have enough orders on hand to keep them in operation until next July.

The Electrical Accumulator Lighting and Power Company, of St. Louis, have just closed the contract to erect a central station electric light plant to illuminate the City of Dyersburg, Tenn., by the accumulator system of "storage batteries."

Matthew Addy & Co. report that the Pioneer Furnace, located at Thomas, Ala., made last week 902 tons of iron, of which 83 per cent. was foundry grades. It is claimed that this furnace, size considered, is beating the record, for output and quality, of Southern furnaces.

The Iron Age

New York, Thursday, January 24, 1889.

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF, JR., - - EDITOR.
GEO. W. COPE, - - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS, - - - HARDWARE EDITOR.
JOHN S. KING, - - - BUSINESS MANAGER.

The Pig Iron Situation.

During the past few weeks matters in the pig-iron trade have been rapidly approaching a crisis, and the situation demands the closest study both on the part of the producer and of the consumer. The weakening has become general and widespread, and there is nothing to be gained by blinking at the facts. We believe that a careful survey of the ground cannot fail to lead to the conclusion that for the time being consumption has fallen behind current production. Our statistical reports have proven that the latter is progressing at the rate of 7,500,000 gross tons per annum, not counting imports of pig, of which a certain quantity, chiefly manganiferous material, must be purchased from abroad. We are not prepared to assert that the requirements of the country will not take care of such a quantity in 1889. But we are in a dull season of the year, when the average tonnage is not being melted in cupola, converter or furnace. If our ironmasters were generally in the position where a moderate accumulation of stock need not frighten them we might tide over a dull period readily. Unfortunately, the majority of makers are not so situated. A lull in buying, even for a time, causes, as it does now, a sharp drop in prices. We have heard of sales on a large scale much below any yet publicly named in one of the leading markets of the country. The price has not become general as yet, and may not be accepted by the majority of sellers, but it shows, on the one hand, to what length some furnaces may go to capture trade, and, on the other, that the point is not very far off at which very large buyers, having the experience of a lifetime, are willing to enter into heavy contracts.

We have spoken frankly, because we believe it to be for the best interests of the entire trade that the gravity of the situation be thoroughly appreciated. The remedy is clear. Serious loss can be avoided by those who are unable to go below present open quotations by at least \$1 a ton only by blowing out or by banking. There seems little prospect that the position will be materially improved until spring. For some time past complaints have been growing more and more numerous that the prices prevailing until lately were unremunerative. We have reached a lower level now, and unless there is some means of materially cutting down cost, circumstances would indicate that a suspension of operations would be the wisest policy in all doubtful cases. It has been vigorously asserted by a number of pig-iron manufacturers that there was no room for reducing cost. Since that is certainly the case with a good many plants, their owners would do best to face the inevitable now rather than make sacrifices in the hope of an early improvement.

Every decline of a fraction of a dollar narrows down the number of those who are able to make both ends meet, and at the same time increases the number of buyers who reach the conclusion that the time for contracting for supplies has come, but no marked movement can be expected to set in until the obvious disparity between output and consumption has been lessened. To close buyers the present and the near future seems sure to offer exceptional opportunities for making advantageous contracts. In spite of all the wild statements of promoters, or the boastful utterances of some furnacemen, it is a fact that the best prices lately named cut very close to the cost of production of the majority of the best situated and best equipped plants in the country. We repeat that there is little chance for lowering that cost. It is evident, therefore, that we are fast approaching bottom figures, and that a quick adjustment of the output to current requirements may check the present tendency toward demoralization.

Investors as Owners.

One of the most hopeful signs of the times in the railroad world is the disposition shown on the part of owners of stocks and bonds to take a more direct interest in the management of their properties. Stock jobbing has been a national disgrace in the eyes of foreign capitalists. From trading in the stock market upon exclusive, but innocent information, on the part of railroad managers it is an easy step to such quiet manipulation as will force a rise or fall of stock. Of course honorable railroad men would not be guilty of the latter, and yet, if the former is considered legitimate, there is no drawing a line of distinction in practice; while if we prohibit all buying and selling of stocks, we infringe upon a common commercial right, and, more than that, we do not allow a railroad manager to be interested in the success of the road he serves, a principle everywhere recognized as productive of the best service. These chances for stock jobbing are greatly increased by the difficulties which our laws and customs place in the way of combined action on the part of small stockholders. In the Interstate Commission's recent report it is estimated that of all railway capital 48 per cent. consists of bonded debt and 42 per cent. of stock. In most cases the stock alone carries the voting power, while it is a common occurrence to find the management of railroads in the hands of men who own perhaps not more than a quarter of the stock. Thus it appears that it is possible for managers and their friends actually owning but one-tenth of a railroad's capital to control the business and policy of the other nine-tenths. The temptation to use the whole directly or indirectly in the interest of the small minority is great. This would be in part avoided if the large number of small investors could make their influence felt in the policy of the management. Under present circumstances this can best be done through banking firms if they will but take a real and permanent interest in transportation questions beyond the matter of their commissions.

Such action on the part of representative bankers would have a good effect upon the building of new lines and extensions. It would be a great help toward

stopping of parallel lines and those constructed cheaply merely to be sold dearly. Undoubtedly the building of the Nickel Plate or the West Shore furnished purchasers of iron and supplies for the time, but it may well be doubted whether the iron and steel trades would not have done better in the long run had these roads not been built. The losses to investors discouraged legitimate investments in new railroads actually needed, while the usual repairs, which under the pressure were omitted on the older roads, went far to balance the sales to these useless railways. If we would have healthy and steady trade we must discourage such railway building as cannot show good reasons for its plans and a fair chance at least for escaping bankruptcy. In no other business is careful planning so necessary as in this. A factory badly built and losing money is indeed unfortunate, but its losses affect but few comparatively. A railroad built for speculative purposes may for a series of years prevent a number of other lines in its territory from making any money, and consequently from paying for a large amount of renewals and supplies. Railroad gambling, in the long run, is not a help, but an injury, to the iron trade. For much of this gambling in the past our leading bankers must take their share of blame.

Competition is the life of trade, but war is its destruction. We ought not to expect that the former will be eliminated from transportation any more than from any other business, but regarding senseless rate-cutting the bankers can bring to bear a powerful influence. To bring the quarrels to light, and to discuss them, is a long step toward adjusting them—a step, too, which stock and bondholders should long ago have taken. It is not to the interest of business in general that railroads should waste all profit through lack of belief in each other's common honesty. The present agreement among presidents is not greatly different from many others only made to be broken. The new element of representations of stock and bondholders, however, if really determined and not merely temporary, may make a success of the present movement. For the benefit of all concerned, it is to be hoped that some good may come of it.

Western manufacturers and merchants have recently met with more annoyances than usual in the transaction of their railroad business. Some of these annoyances are due to the arbitrary arrangements of railroad managers, while others owe their origin to outside influences over which the railroad officials have no control. One of the most serious is an advance in Colorado and Pacific slope rates on some classes of goods which will effectually check shipments by Chicago manufacturers and dealers on contracts made last fall when rates were supposed to be on a stable basis. Another occurrence of a similar nature was the advance in rates on iron from Ohio points to Chicago, which was made at a time when business was dull, and prices were weak, and all conditions were most unfavorable for the imposition of higher freight rates. So much pressure was brought to bear on railroad officials in this case that a large part of the advance was abated, but rates are still higher than they

were some time since when trade was quite active. The demurrage charged on cars at Chicago after 48 hours is accompanied with considerable inconvenience to many persons who find themselves so circumstanced that they cannot promptly unload merchandise consigned to them. The fine imposed is regarded in various quarters as illegal and unwarranted, and steps are being taken to test the matter in the courts. The last occurrence to vex the minds of shippers is the order just issued by the Government requiring all Canadian-built cars running from Canada into the United States to be held for payment of duty. Exchanges of cars are made on so many railroads operating in the Northwest, involving the use of Canadian-built cars, that it is feared the service may be seriously impaired until the matter is straightened out, with, of course, decided detriment to shippers.

The Western Iron Trade.

General complaint is made of dullness in all branches of the iron and steel trades. Business is so unusually depressed and orders are so remarkably scarce that surprise is everywhere manifested at the peculiar conditions prevailing. The outlook is by no means discouraging, as there are no ominous clouds in the financial horizon, no political disturbances are pending, harvests have been good, money is plenty, trade is not being interfered with by epidemics, labor is fairly employed and apparently more contented than for years, and why such a restriction of business should occur under these circumstances is most perplexing. It is true that more or less talk is heard of the disturbing influence of the railroad question. But the railroads are better off now than they were a year since. Then they were suffering from a scarcity of freight. The roads running through purely agricultural regions were barely able to pay expenses, and, in fact, some of them ran behind. They were obliged to retrench in every way, and they did. Business generally suffered in the early part of 1888 in consequence of it, and a whole train of woes accompanied the leading cause, all of which had their influence. But now the railroads have passed through that most trying period, they are in shape to invest more freely in repairs and betterments, and even if new work should lag for a time, a heavy demand is to be naturally expected to meet the necessities of old lines.

As usual, the first effect of the depression is to reduce the price of pig iron. With the present relations of supply and demand, hardly a commodity can be named which is so sensitive to the varying phases of the general condition of business as pig iron. Productive capacity has now reached such a point that the consumption must keep up to high water mark constantly, or the price cannot be sustained at figures which will make it profitable to operate any but the best or most favorably located furnaces. Owners of furnaces realize this thoroughly and are ready to adapt themselves to the situation. It is part of their business. Already preparations are being made to blow out furnaces in the West at which pig iron cannot now be profitably made. The

owners and operators will not risk the accumulation of large stocks of pig iron, as they do not know how long the depression may continue, nor how far the slump in prices may go. The bottom prices of last year are now in sight, but it is possible that a lower depth may be touched before recovery sets in. Yet the prompt blowing out of furnaces may check the production sufficiently to correct the market very speedily.

It is well for those who are looking for very low prices to bear this in mind. Prices are not high now in Western markets, and much more of a decline is hardly to be expected. If those who need iron and steel defer their purchases too long they may find the supply considerably curtailed and prices much firmer. With the producers suspending operations the impetus of the decline will be arrested, and the whole face of affairs may speedily be changed. It seems almost incredible that the present lull should be any more than temporary, although it must be admitted that it has continued long enough to excite apprehension. But the condition of the great masses of the people is too good, barns are too well stocked, corn-cribs are too well filled and prosperity too generally abounds for serious belief in approaching financial troubles.

Late Developments in Venezuela.

There are indications that the frontier dispute between Venezuela and England about the boundary line between the former and British Guiana near the Orinoco River is about to enter an acute phase. It may not be out of place, therefore, to note recent occurrences in that Republic, and show the actual state of affairs. On July 5 last year the new president, Dr. Pablo Rojas Paul, was installed at Caracas for a term to end on February 20, 1890. He succeeded General Hermogenes Lopez, who, since August 9, 1887, filled the unexpired term of Gen. A. Guzman Blanco, the latter being the successor of President Joaquin Crespo. Early in December last the latter made a thoroughly organized attempt to upset the new administration, but was captured with all his followers. Leniency at home seems to be the policy of the Paul administration so as to stand united against England; hence Crespo has been sent into exile and left for Buenos Ayres, and his followers have been pardoned. The new president is considered a man of great ability, and through long and varied experience well fitted to govern the country. It is also hoped that he may be able to bring about an equitable settlement of the boundary question alluded to, Gen. A. Guzman Blanco's endeavors as Venezuelan representative in Europe, resident at Paris, having led to nothing in this matter so far.

The difficulty is that the territory in dispute is so large and valuable and that the action of former governors of British Guiana has complicated the question. When Venezuela and the rest of Spanish America gained their independence, the boundary lines between the former colonies of Spain, mutually, and between them, Brazil and the possessions of the Netherlands, were not well defined, and the negligent old Spanish surveys—as recorded and mapped in the Colonial Office at Madrid—continued to be looked upon as the frontier between them until recent ex-

plorations led to a better appreciation of the resources of the various countries and caused new surveys to be ordered. Differences then began to arise, leading to wars in some instances, to arbitrations in others, and leaving matters in suspense in a few cases like this Venezuela-Guiana dispute. Venezuela has declared its readiness to submit the matter to arbitration, but England does not consider the present dispute a proper subject to be arbitrated upon, as it accuses Venezuela of gross encroachments on the territory in dispute, one of the richest gold-producing countries extant. Recently England has garrisoned Barima Point, situated close to the mouth of the Orinoco River, which—according to the maps of Guiana—belongs to the latter. A great outcry is now raised in Venezuela, American interference is invoked, and the Monroe doctrine appealed to. While Venezuelans appeal to the latter, Colombians protest against its application to the Isthmus.

In all other matters Venezuela has been getting on remarkably well. Coffee, the chief product, has yielded abundant crops, which have brought high prices here and in Europe, and have enriched the planters. The national indebtedness has, by agreement with bondholders, dated November 24 last, been converted, the foreign debt into £2,675,350 and the internal into £1,078,076 bonds, bearing 4 per cent. interest, secured by customs revenue. The income of the nation was 38,686,246 francs and the outlay 28,644,576 in 1886-87; the budget of 1887-88 squares the expenditure of 27,695,000 francs by a revenue of equal amount. Railroad building has been actively taken in hand by French and German capitalists. Guzman Blanco's permanent stay in Paris as ambassador has done a deal of good to his country; he is personally worth some \$15,000,000, and has inspired capitalists in Western Europe with confidence in Venezuela. Liberal privileges are extended to those who embark in Venezuelan enterprises of a permanent nature. There were, on December 31, 1886, 286 km. of railways in running order, 353 being built and 1982 new concessions granted. Since then various important concessions have been granted. Frederick Krupp, of Essen, Prussia, has undertaken to build the "great Venezuelan railroad," backed by the leading German banks, which is to connect Caracas with San Carlos via Antimano, La Victoria and Valencia. On part of the capital the Government guarantees 7 per cent. interest per annum. A similar guarantee is extended to the Callao-Las Tablas Railroad to connect the gold mines with Las Tablas on the Orinoco, below Ciudad Bolivar, which the Paris Crédit Mobilier and Société des Dépôts et Comptes Courants have engaged to construct, the Batignolles Construction Company having bound itself to build the road within a stipulated short time.

The length of telegraph lines in operation on June 30, 1886, was 4462 km., with 30 offices, the receipts being 239,051 francs in that year, and the expense 886,188. The postal service was carried on through 162 offices handling 2,734,576 pieces of mail matter, the expense involved being 553,868 francs. The regular army has at present a strength of only 2000 rank and file, but the number of combatants may be increased to 100,000 by enrolling

the militia and volunteers. The navy consists of five men-of-war, three of which are steamers. Venezuela imported in 1885-86 62,453,378 francs' worth of merchandise, the greatest amount coming from this country, 15,296,873 francs; from England 9,690,105; from France 9,272,379; from Germany 8,949,085, and from the West Indies 1,680,691. The export reached 82,304,289 francs including 20,107,675 francs of gold bullion, 3,308,911 ores, and 4,442,707 coin. The bulk of products was: coffee, 35,733,423 francs' worth, cocoa, 8,447,986; hides, skins, cattle, cabinet woods, tonka beans and dividivi. There entered Venezuelan ports in 1886 9263 vessels, 1952 thereof being steamers, the joint tonnage being 2,052,140. American trade shows these figures:

Fiscal year.	Import.	Domestic export.
1888.....	\$10,051,250	\$3,008,336
1887.....	8,261,236	2,827,010
Increase.....	\$1,790,014	\$181,326

This increase of nearly 20 per cent. was due to the rise in coffee, the import of which into the United States has risen considerably; from 11,858,478 pounds in 1870 it has increased to 59,463,487 in 1887. The copper product of New Quebrada was 2900 tons fine in 1887, against 3708 in 1886 and 4111 in 1885. There are 14 gold mines in the Yuruari district. Of these the Callao is the richest, turning out 28,808 ounces the last six months. It is owned by a company of Venezuelans, with headquarters at Caracas. The Callao-Bis is owned by an English company, whose office is in London. The Caratel was the first mine discovered. The Tigre, Nueva Providencia and Union are owned by a Venezuelan company. The Eureka and Bolivar Hill are owned by French companies whose offices are in Paris. The Chile, Panama, Potosi, Peru and Nacupsi mines are English, with offices in London. In 1873 the total output of all the mines was \$608,742; 10 years later it was \$4,000,000. While commercially the United States are chiefly interested in Venezuela, England, Germany and France are so in mining and railroads, hence there is a considerable international interest attaching to what is going on in the country, and the turn which the boundary question will take is closely watched abroad.

The annual reports which are coming in from Great Britain emphasize the fact which we have repeatedly alluded to that the ironworkers abroad are enjoying a period of moderate prosperity in spite of the great decline which has taken place in the volume of business done by them with this country. W. Fallows & Co., of Liverpool, in their elaborate review print the following table of exports:

British Exports of Iron and Steel.

Year.	Total	To United States.	Other countries.
1888.....	3,968,984	639,760	3,327,224
1887.....	4,146,907	1,282,445	2,864,462
1886.....	3,338,494	804,570	2,533,924
1885.....	3,128,352	397,618	2,730,739
1884.....	3,496,352	454,804	3,041,548

In other words, the expansion of business with other countries has nearly compensated for the great falling off in the quantities sent to this country. Considering the relation of prices abroad and here this means that our imports will be cut down to a minimum, which they practically are now. It means, too, that should a reaction come from the extreme depression through which nearly all departments

of the iron and steel trades are now passing, we could recover materially without any danger from an active participation of foreign makers in our markets. There may be little consolation in that fact now, but it is a circumstance which should never be lost sight of either by producer or by consumer. So far as pig iron is concerned, the statistical position in Great Britain has certainly improved during 1888. We present the figures below:

Production and Stocks of Pig Iron.

Year.	Production.	Stocks.
1888.....	7,900,000	2,400,000
1887.....	7,441,927	2,616,366
1886.....	6,870,665	2,491,506
1885.....	7,297,295	2,352,169
1884.....	7,528,996	1,909,467
1883.....	8,490,224	1,063,976

In the leading districts, the principal figures of interest are:

Production:	1888.	1887.
Cleveland.....	2,614,983	2,508,184
Scotland.....	1,027,744	932,240
West Cumberland and Barrow.....	1,373,400	1,470,000
Stocks, December 31:		
Cleveland.....	472,628	637,682
Scotland.....	1,244,433	1,223,040
West Cumberland.....	562,000	571,700

While all of the product of the West Cumberland district is Bessemer pig, only a small part of that of the Cleveland and Scotch furnaces is Bessemer or basic. The total amount of the product of Bessemer pig is estimated at 3,064,837 tons in 1888, against 2,600,000 in 1887, while the make of steel ingots rose from 2,264,000 tons in 1887 to 3,047,000 tons in 1888, not less than 471,510 tons of basic being used in the manufacture of steel.

Bridging New York Waters.

Still another great bridge scheme is on foot designed to facilitate communication between New York City and its environs. The parties concerned call themselves the Grand Bridge Company, and they ask for an act of incorporation; capital, \$10,000,000. The location will be fixed somewhere between New York City and Brooklyn, across the East River, by commissioners to be appointed. Other details, respecting the appurtenances, rates of toll, &c., are provided for in a bill now before the Legislature of this State. The remarkable success of the Brooklyn Bridge, both financially and mechanically, inspires confidence in any similar undertaking. The opening of the Poughkeepsie Bridge doubtless will be attended with results not less satisfactory, at least as respects those sections of the country more immediately affected. An important coal trade will be developed in a direct line from the Pennsylvania mines to the Eastern States irrespective of shipments of general merchandise. To what extent the local traffic of New York City may be influenced adversely or otherwise remains to be seen. It does not appear as yet that the bridge will be any serious impediment to navigation. The great bridge across Staten Island Sound, at Kill Von Koll, is another enterprise which may have important consequences and to some extent affect the channels of trade. The general welfare will be promoted if it provides facilities for more complete railway connections, thereby in a more literal sense making New York City the trade center of the United States. In addition, the Staten Island bridge practically extends the water front of the metropolis, and makes available for warehouse purposes a wide

extent of territory, which at a day by no means remote will all be required by the increasing demands of our foreign trade. Still another bridge will be thrown across the East River at Blackwell's Island, and the Manhattan Bridge Company, Edmund Driggs, president, propose to erect another. Engineer Lindenthal's monster bridge at Washington Heights to cross the Hudson is yet in embryo. Altogether, at least a half dozen bridge schemes invite the attention of capitalists hereabout, and no miraculous gift of prescience is needed in order to discern through the vista of coming years a network of aerial structures connecting New York City and its environs which will dwarf in the comparison anything now seen in London or other great centers of European traffic. In the present stage of modern engineering that man is a bold pessimist who pronounces anything mechanically impossible.

Bi-Sulphide of Carbon Motors.

Quickly following the exposure of the Electric Sugar-Refining fraud comes a story of serious trouble about a wonderful "Triple Thermic Motor," in which several reputable men are concerned. The promoters evidently believed they saw a new road to fortune. Nor are they the first victims. They saw machinery successfully worked by substituting bi-sulphide of carbon for steam. It drove pistons economically and with great power. What more could be desired? The machine was set up in Newark for exhibition. One of the victims describes his experience as follows: "Naturally we wished to see the wonderful motor in action. So we went up to the machine shop, 277 Passaic avenue, where the whole thing was in operation. All the machinery was there on the first floor, and it was in full operation, just as any machinery run by steam. But the vaporizing machinery, where the bi-sulphide of carbon was said to be vaporized by steam, so as to produce this wonderful power, was in a closed room, and there it was sacredly guarded. It was in charge of an engineer named Knight. Well, there was a peep-hole in the wall inclosing this machinery, and we were allowed to stand at that and gaze in. Of course we could tell nothing about the thing in that way. Nobody got nearer than the peep-hole. All the investors around here had to go it blind in confidence in the men who fathered the scheme."

Like the electric sugar-refining apparatus, it was seen through a "peep-hole," but enough was seen to induce scores of people to invest their money, and now the courts are invoked to award damages in large amounts. One of the counsel employed for the defense seems to have obtained an inkling of the truth, when he says in a reported interview: "So far as the theory of the Triple Thermic Motor goes, it is all right and undoubtedly a good thing, but there are some practical obstacles which prevent its present success. The object to be attained is the production of an expansive vapor without the great waste of heat necessary in using water for that purpose. Bisulphide of carbon is theoretically the solution of the problem. On the other hand, bisulphide of carbon is a powerful agent, and rapidly corrodes and deteriorates the boilers and machinery in which it is used." In other words, the clergymen lent their influence, unwittingly, as we must charitably assume, in support of an "exploded fallacy." It would be needless to look outside of New York City for evidence amply substantiating this position. Only a very few

years have passed since the public, of course including reporters, were challenged to examine critically the bisulphide motor. Even engineers summoned to witness the exhibition were unable to refute the pretensions then put forth. Suffice to say, the scheme was apparently abandoned, and inquirers at a later day found only portions of machinery rendered useless by corrosion. Moreover, the bisulphide was extremely offensive to the sense of smell, so that a "peep-hole" would amply satisfy any ordinary inquirer for information.

In accordance with views briefly presented above, omitting more than a reference to painful experiences in Lowell, Mass. (where "Professor Trowbridge, of Harvard," made a report construed as endorsing the motor, preparatory to issuing a prospectus), the well-known patent lawyer Edw. N. Dickerson writes as follows:

The papers are giving an account of a stock company founded upon a "bisulphide of carbon" engine, the stock of which has been sold to many victims in Newark and elsewhere, for a great price. This particular form of humbug is very old; and it is very insidious, because of the great pressures which this substance will develop at low temperature. Before 1856 this deception was practiced on Wall street, and another like it called the Cloud engine. In that year I published a statement about these things, a copy of which I annex. My prophecy has been fully realized. The bisulphide machine has since been twice used as a swindle—once at Pittsburgh and once at Boston—and the Cloud engine again deluded a large number of very respectable gentlemen in this city about one year ago. My publication was in a note accompanying the report of an argument in court.

EDW. N. DICKERSON.

NEW YORK, January 17.

[Extract from an Argument Published in 1856.]

This Cloud engine enjoyed a remarkable existence at the Novelty Works, about as long as its relative, the Vampire, both belonging to the genus humbug. Cloud was ushered into public notice with more imposing circumstances than Vampire, however, Mr. Horatio Allen starting it out with a "first-rate notice," every line of which was redolent with wisdom. After giving some rows of figures for the purpose of appealing to the popular credulity which is expressed in the maxim "figures can't lie," the certificate concludes as follows:

"What the proportion of saving is to be remains to be determined by more extensive use; but I am constrained by the facts which have been developed by these trials to state my belief that the Cloud combination will take the place of the high pressure engine, and prove itself one of the most extraordinary and valuable inventions of the age. Yours respectfully, HORATIO ALLEN."

And again:

As the result of the trials referred to, I have to state the increase of pressure arising from combination of steam and air it proved beyond a doubt, and that the increased useful effect resulting from this increased pressure, as shown by these trials, is more than 50 per cent.

In building a high-pressure engine for myself, or for parties who would leave the question of the kind of engine to me, I would unhesitatingly adopt the Cloud engine, and in taking this position I rely upon the facts which have come to my knowledge in the trials made under my directions. HORATIO ALLEN.

Novelty Works, New York, July, 1854.

Referring to the "Vampire" *id genus omne*, Mr. Dickerson adds that it takes about 18 years for one of those animals to revive, that charlatans may grow rich. Taking all in all, there is reasonable ground for pronouncing the "thermo motor" a chameleon of the vampire stamp, assuming attractive hues to correspond with the varying conditions of the market. And so long as dupes can be found, just so long shall we hear of impending revolutions that amount to nothing.

The rates of freight on Southern pig iron, to take effect on February 1, are announced. They are on the basis of \$2.75 from Birmingham, \$2.25 from Chattanooga and \$2.50 from Sheffield to Cincinnati.

CORRESPONDENCE.

The Advantages of Coke for Fuel

CHICAGO, JANUARY 17.

To the Editor: There has been considerable comment in the scientific and other papers upon the late reversion to the use of coal as fuel by some iron manufacturers in the natural gas regions. Without entering at the present into the reasons for which this has become economically possible, we are led by the fact to speculate on the propriety of locating such immense plants as we find in certain districts that have little but the precarious advantage of a natural gas well to recommend them. Of course, it is a matter that admits of exact calculation to determine where a given industry would be placed to best advantage, having regard to costs of fuel and other materials, labor and transportation, but we are inclined to think that in assigning a relative value to natural gas wells there has often been dangerously small allowance made for the fluctuating and uncertain character of the supply. So enormous is the importance of cheap fuel in our great industries, that large amounts of capital are eagerly invested in building new works to secure what already in some cases has proved but a temporary advantage in this respect. And few things are now more generally appreciated than the importance of having our tangible fuel supply mined and used in the most economical manner possible.

The advantage of coke over raw soft coal as a fuel is that otherwise useless slack can be made available by admixture in its manufacture, and especially that it can be perfectly and smokelessly burnt without the need of skilled labor. And we cannot doubt that the public demand for a clear and healthy atmosphere will finally result in the almost complete substitution of coke fuel for soft lump coal. It is to be noted, however, that under present conditions this means simply that the smoke and waste resulting from irregular and incomplete combustion are to be confined to the coking regions. There is an actually augmented waste of fuel incurred in the coking system which is only compensated for by the comparatively low price of coal where it is free from transport charges. The cause of this additional waste is the high percentage of volatile matter contained in soft coal, particularly in our Western soft coal, which yields but one-half its weight of coke. In other words, over one-third of the coal used, including all of the hydrocarbon gases, is burnt and dissipated at the coking ovens.

Under the best mode of treatment (in beehive ovens) it is admitted that only 15 per cent. of the weight of coal needs to be used in coking—say 5 per cent. solid carbon and 10 per cent. of volatile matter. The rest of the volatile matter, which amounts sometimes to one-third of the weight of the coal, is wholly lost. This is the point we would emphasize—namely, that while coke, or artificial hard coal, is practically the best and almost the cheapest fuel for general purposes, there is yet the burden of an exceptionally heavy item of waste in its manufacture.

Very many unsuccessful attempts have been made to recover the excess of coal gases, but it must not be inferred that this cannot be made practicable. It is claimed that by a simple process, now worked in the North of England, all of the excess gas, together with considerable ammonia, is secured, and we learn that a prominent Chicago firm is experimenting in the same direction. The attainment of this object is of national concern, and will involve consequences of the highest magnitude. It will insure the supply of much cheaper coke, and, therefore, the disappearance of smoke from our cities. Existing coking plants will be looked on as artificial gas

wells, from which a permanent and uniform flow of fuel gas can be developed, in both of these respects far more reliable than the supply from any natural gas well. It will furthermore be practicable to set up coke works near large cities, where use can be found for every spare unit of heat that can be secured. For there is no smoke nuisance at such coke works as we refer to; indeed the process applied thereat may be defined as smoke prevention by withdrawal for separate use of all superfluous distillation products from the coal.

A. J.

The Iron-Ore Trade at Buffalo.

Edward B. Guthrie, C. E., of Buffalo, has contributed to the *Railroad Gazette* the following in relation to the iron-ore trade at Buffalo: The great increase in the last three years in the amount of ore handled at Buffalo has gone on with very little attention, considering its magnitude. The receipts of iron ore at that port since 1885 have been as follows, in gross tons:

1885.	1886.	1887.	1888.
7,160	28,430	30,760	246,850

From these figures it is seen that the increase in 1888 has been some 700 per cent. Of the amount received in 1888, all but 26,500 tons had been reshipped at close of navigation. There is now talk of remodeling and starting up the furnace at Iron-ton, located about 15 miles north of the city, on the Niagara River. This furnace has been out of blast 10 or 12 years, and it is rumored that Bessemer pig will be made. Buffalo, with its shipping facilities by water and rail and its cheap fuel, ought to make a good point for manufacturing steel, though its two iron mills have been long out of use.

During the past year three ore docks have been started at Buffalo, one under control of the Lehigh Valley Railroad, on the Tift Farm Improvement, having a length of 2100 feet and width of 200 feet; one controlled by H. K. Wick & Co., located on the Blackwell Canal, 1460 feet long by 200 feet wide; one, the Minnesota Docks, controlled by the New York, Lake Erie and Western, located on Buffalo River, about 500 feet long by 200 feet wide.

At each of the first two, three hoisting and conveying machines, made by the Brown Machine Company, Cleveland, Ohio, are used for hoisting the ore from vessel, conveying it back for immediate reshipment on cars, or stocking up on dock. Each machine consists of a trussed bridge, supported by a pier at each end, movable on tracks parallel to the face of the dock. The bridge is 180 feet long between piers, with a cantilever extension 80 feet long, for dumping beyond the rear pier, and a hinged projection, 34 feet long, allowing buckets to be directly over a vessel's hatchway. The height at the dock end is 30 feet, at the rear end 45 feet, enabling the empty buckets to return to the vessel by gravity. The power consists of three double cylinder engines located at one of the movable piers, operating the buckets, hoisting from out the hold, conveying back from the dock, and moving the whole plant from one point to another in a direction parallel to the face of the dock. Each bucket holds 1 gross ton, and from 1200 to 1500 gross tons can be handled with reasonable speed in ten hours.

At the Minnesota docks five McMilar steam cranes are used, which run on a track parallel to the face of the dock. By these the ore is hoisted from vessel and is then either dumped into cars on parallel tracks for immediate reshipment, or into small cars running on trussed girders supported at each end on movable piers, at center on a fixed pier, the former piers being operated by hand through gearing

transferring the plant from one point to another. The girders are at right angles to the face of the dock, and along them the small cars of ore are pushed by hand, and the ore dumped on to dock where it is stacked. Each bucket is said to hold 2800 pounds, and 1000 tons are handled in ten hours with the five cranes. The first-mentioned machine is the cheaper to operate, and the most speedy, all the power being furnished by steam and gravity. The first two docks were not in operation until August or September last, while the third was started a little earlier.

The Henderson Heating Furnace.

James Henderson has recently erected at McKeesport, Pa., a furnace for heating wrought scrap iron with natural gas. In the construction of this furnace six 1-inch gas-pipes are placed at one end, which deliver the gas into a large expansion chamber, the quantity being regulated by valves and a pressure gauge. The gas expands till it fills this chamber, traveling from the entrance several feet to where it meets the air blast delivered in measured quantity in proportions to produce perfect combustion, through tuyeres placed on each side of the gas channel, delivered diagonally forward to a focus at the entrance to the heating chamber, where combustion takes place. The gas in passing to the air is probably heated to 3000° F. before they meet, and as the air is cold and the gas expanded their volumes approximate being equal and produce a greater effect than when either or both are heated by regenerators.

The bed of the heating chamber is 20 feet long, 4 feet 6 inches wide, and 5 feet space intervenes between it and the roof in the clear. The flame is from 1½ to 2 feet above the piles on the hearth and 1 foot from the roof all the way from the front to the uptake. Iron charged simultaneously at each of the four doors of the furnace becomes as quickly heated at the uptake as where the combustion takes place or, in five minutes 250 pounds charged at each door is at a welding heat ready to draw, so that five piles may be heated every five minutes of 250 pounds each. By charging at one door and drawing at the same time from another a pile may be drawn every minute, amounting to 1440, or 180 tons in 24 hours. It is claimed for this furnace, if doors be applied which exclude air during the heating (which is not the case at McKeesport, where it was sought to ball up through a hole in the door), that the waste in heating iron will be largely reduced. The economy in fuel is very great, as the gas ranges from four pipes at 8-ounce pressure to six pipes at about 4-ounce pressure, which is one-half to three-quarters of the gas used in the old kind of heating furnaces, while the output is claimed to be seven times greater from a much smaller quantity of gas, say, from nine to ten times less.

Wrought iron exposed on the hearth of this furnace in large lots begins to melt in 10 minutes, becoming so soft that it cannot be balled except water is thrown upon it to cool it, indicating that the furnace will melt rapidly and be economical for making open-hearth steel. The cost of a furnace would not be over \$3000 for a bed 20 feet long and 20 feet wide, to make 20 to 25 tons of open-hearth steel per cast. There are no regenerators, nor is there any heated air used. A small fan blower is placed in the gas pipe, where there is a possibility of a deficient supply of gas to exhaust gas from the wells and at the same time to increase the quantity used, if so desired. This fan may be placed on the shaft that carries the fan for measuring the air, and be driven by the same pulley, and thus measure the air and gas automatically. Where scrap iron is to be

had in quantity, this furnace will increase the output of a works up to 180 tons per day for an outlay not exceeding \$2000 where natural gas is used. If coal is used to make the gas, the cost will be increased by that of a gas producer.

Washington News.

(From Our Regular Correspondent.)

WASHINGTON, D. C., January 22, 1889.

The programme of the Republican managers, now that they have succeeded in passing their tariff substitute, is to let it go to the House, where they expect the Committee on Ways and Means to pigeon-hole it. The measure not receiving concurrent action will then be in condition to receive consideration either during an extra session in May or at the regular session in December. The managers favor an extra session, as it offers a pretext for an earlier organization of the House and lessens the chances of losing control by the possible inroads of mortality upon the slender margin of Republican majority. The Sub-Committee on Finance are emphatically in favor of an extra session should no action be taken on the Senate substitute in the House, for the reason, as one of their number said, that they had promised the manufacturers that something would be done in accordance with their wishes if the elections turned out satisfactorily. They now propose to keep their promises. The Senate substitute is the most decisive step in the direction of protection on principle yet taken, and fixes the issue on the economic policy of the Republican party. The party leaders, in the main, think the bill wise, but some of the most sagacious are of the contrary opinion. They do not regard the bounty provisions as likely to enlist popular favor, and claim that it will ultimately react to the discredit of the protective theory. The point claimed for an extra session is that a bill passed in May or June will have at least six months' trial, and then have ample time for amendment where it pinches before the close of the long session. This, it is thought, will put an end to industrial agitation and enable the great interests of the country to enjoy a few years' respite.

The problem which most concerns the party leaders just now is the probable action of the Randall committee and the House on the Cowles tobacco bill. That bombshell landed in the free-trade camp has created undisguised consternation among the friends of Chairman Mills. It is not Mr. Randall's purpose to have any contest himself. As soon as the Senate substitute reaches the House and is referred to the Committee on Ways and Means, and a reasonable time is allowed for a report. The Committee on Appropriations will act upon the revenue bill sent to them under instructions of the House, the bill will be reported back and the friends of the measure will be left to take charge of it in their own way. The reference of the bill to Mr. Randall's committee was not particularly pleasing to that gentleman, as it placed him in a position which he was not anxious to assume at this stage of the tariff controversy. There is not an improbability that the tobacco men in the House will attempt to take some action with reference to the Senate substitute. There are some who believe that if the measure could be brought to a vote it would secure a majority. The Senators, however, do not expect action so as to bring it into conference. Chairman Mills is disposed to hedge by saying that he would favor a tobacco bill, and is inquiring why the Virginia, North Carolina and other Democratic advocates of tobacco repeal did not take that feature of a bill in his committee. As Mr. Randall expressed it, the most important feature of the Cowles movement was that it rent

asunder the chains in which the Committee on Ways and Means have held the majority throughout this entire Congress. The tobacco men who from party interests and discipline submitted to this tyranny proposed, before the authority of the House passed into other hands, to give some expression of their views in opposition to the restrictive policy of the committee.

The Pneumatic Gun.—The Zalinski pneumatic gun has been proved to be a powerful weapon for harbor defense. On Saturday this gun was charged with 200 pounds of dynamite and 325 pounds of explosive gelatine and threw a shell from Fort Lafayette with sufficient force to destroy the strongest armored vessel a mile distant. Three guns of this kind are to be placed upon the Vesuvius, which has just proved itself to be the fastest war boat in existence, the contract being that they can be fired at intervals of two minutes. Compared with the Krupp gun this weapon appears to have the advantage. The American gun, with carriage, weighs 85 tons less than the German gun of the same caliber, and costs, with carriage, \$125,000 less. Again, it is to be presumed that the effect of one of the American dynamite shells would be much greater than the destruction caused by a Krupp powder-loaded shell.

Horace Tuttle, of the firm of Tuttle, Oglebay & Co., Cleveland, Ohio, was instantly killed in a railroad accident in Northern Michigan on the 19th inst. Mr. Tuttle was a well-known dealer in iron ore, his firm having very extensive connections and representing large interests. He was a man of endearing personal qualities, and the news of his sudden and untimely death is received with universal regret throughout the iron trade of the Northwest. Lieutenant-Governor Macdonald, of Michigan, a prominent business man of Escanaba, and William Cochrane, of the Cochrane Milling Company, Escanaba, perished in the same accident. Their loss is a heavy blow to that enterprising town, whose recent rapid progress in manufacturing activity was in a great measure due to them.

It is now a settled thing that there will be no advance in the price of coke for February delivery and unless there is a decided movement in the demand within the next few weeks a slight decline in present prices is liable to take place. The leading operators in the Connellsville region are taking orders for delivery next month at present prices, which are as follows: Furnace coke, \$1.25; to dealers, \$1.35; foundry coke, \$1.50; crushed coke, \$2.20; all on board cars as ovens, per ton of 2000 pounds. Freight rates from ovens to Pittsburgh, 70 cents per ton; to Shenango Valley, \$1.35; Cleveland, \$2.80; Chicago, \$2.75; East St. Louis, \$3.20. Prices at other points are quoted as follows: Chicago, \$4.25; St. Louis, \$4.70; Louisville, \$4.70; Kansas City, \$7.25; Toledo, \$4; Buffalo, \$4.50. In the latter place Reynoldsville coke is quoted at \$3.75 and at Chicago at \$4.25. New River coke brings \$4.25 at Chicago and \$4.75 at Louisville.

The fourth annual installment of the extension indebtedness of Oliver Brothers & Phillips and the Oliver & Roberts Wire Company, Limited, will, we are informed, be paid at maturity on February 1. The amount, including interest at 6 per cent., is \$306,058.85. This leaves but one more payment to be made by these firms.

One of the furnaces of the Troy Steel and Iron Company, at Troy, N. Y., was blown in on foundry iron a few days since.

TRADE REPORT.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St.
PHILADELPHIA, Pa., January 22, 1889.

Pig Iron.—The feeling is still very much unsettled, and it is difficult to say what the outcome of the continued dullness will be. On the whole, prices have held remarkably well, 50¢ of a decline being about the average since November 1. The time is at hand, however, when something decisive may be expected, as things can hardly remain in their present condition for any length of time. The general impression is that the demand will pick up sufficiently within the next couple of weeks to check any further tendency toward a decline, although there may be exceptional transactions at specially low prices before the market steadies itself. Sales during the week have usually been on the basis of \$18 @ \$18.50 at tide for No. 1 Foundry, \$17 @ \$17.50 for No. 2, and \$15.50 @ \$16 for Gray Forge, with a few special brands at \$19 for No. 1 and \$16.50 for Gray Forge. On the other hand, sales of Southern brands have been made at \$17.75 for No. 1 Foundry, \$16.50 for No. 2 and \$15.25 for Gray Forge, delivered in consumers' yards, quality said to be equal to Pennsylvania standard. There is some pressure to realize on pretty much all descriptions of iron, but there is a disposition to hold prices as above quoted, one reason for which is that consumers will not take large lots, and another is that they prefer certain brands, and as concessions would not increase the size of the order, sellers feel that they may just as well maintain their prices. Consumption is large, and as the furnaces have not accumulated very heavy stocks there is a fair probability that prices will not go much below what are current to-day, although a good deal will depend upon the course of the markets South and West. At present there is a considerable amount of urgency from these points, but there is an impression that it will only be of temporary duration. Pennsylvania Gray Forge, said to be of strictly good quality, is offered to-day at \$15.25, delivered in consumers' yards.

Foreign Iron.—There is some inquiry for high-grade Bessemer, for which holders ask about \$20.50, c. i. f., duty paid. Speigleisen is held at \$27.25, with buyers at about \$26.50. Prices are said to be too high, however, to permit of business.

Blooms.—There is a good demand, and in most cases at prices about as follows: Steel Nail Slabs, \$28.50 @ \$29, at mill; Billets, from \$32 to \$36, according to analysis; Charcoal Blooms, \$52 @ \$54; Run-out Anthracite, \$42 @ \$44; Scrap Blooms, \$32.50 @ \$34 per "bloom" ton of 2464 lb.

Muck Bars.—The supply is in excess of the demand, so that prices are weak and irregular. Some of the best makes are held at \$28.50 @ \$29, delivered, but there are others offering at about a dollar less, without attracting buyers. Small lots have been placed at \$28 @ \$28.50, Philadelphia delivery, but the demand is limited.

Bar Iron.—The market shows no sign of improvement, and prices are again a shade lower, although nominally the same as last week. There are so many anxious sellers that buyers have no difficulty in securing concessions on lots of 100 tons and upward. As a rule 1.70¢ @ 1.75¢, at country mills, is quoted for good iron, with a fair amount of business taken at the medium figure, although in one or two instances still lower rates have been ac-

cepted. Some of the larger mills maintain 1.8¢ @ 1.85¢ as their quotations, but only limited quantities can be placed at those figures. The outlook is not encouraging at the moment, although it is thought that Skelp orders will be on the market soon, which will be of material benefit to the Bar trade. Expectations on this point are very sanguine, but as yet it is not known that bids have been made for any but small lots. Asking prices are 1.82½¢ @ 1.85¢ for Grooved Skelp and 1.90¢ @ 1.95¢ for Sheared.

Plate and Tank Iron.—Business is in a very unsatisfactory condition, although in one way or another there seems to be plenty of work within reach. The great trouble is in regard to prices. Buyers have been asking for options on large lots at figures which sellers would be willing to accept for prompt deliveries, but it is not satisfactory to have them kept open for three or four weeks, which some of the parties appear to require. What the mills want is work to go on with, as there is a possibility that there may be plenty of business later on, as well as better prices. Meanwhile, quotations are feverish and irregular, and nominally as follows: 2¢ @ 2.1¢ for Ordinary Plates and Tank Plates, 2.1¢ @ 2.2¢ for Universal Plates; Shell, 2.4¢ @ 2.5¢; Flange, 3.5¢; Fire-Box, 4¢; Steel Plates, Tank and Ship Plate, 2.2¢ @ 2.3¢; Shell, 2.7¢; Flange, 3¢ @ 3½¢; Fire-Box, 3½¢ @ 4½¢.

Structural Iron.—There has been very little new business placed of late, but some of the mills are kept fairly busy on old orders. The position remains much the same as for several weeks past, plenty of work talked about, but very little actually given out. Still, the prospects are favorable for improvement, and it is thought that a good deal of business will be on the market in the course of two or three weeks, although in the meantime things are very dull. Prices are about as follows: Bridge Plate, 2¢ @ 2.1¢; Angles, 2¢ @ 2.1¢; Tees, 2.4¢ @ 2.6¢; Beams and Channels, 2.8¢ for Iron or Steel.

Sheet Iron.—There is a fair demand for Sheets, but it is found almost impossible to maintain prices, so that some shading has been done on desirable orders. Prices for small lots are about as follows for the best makes.

Best Refined, Nos. 26, 27 and 28....	3	@ 3½¢
Best Refined, Nos. 18 to 25....	2½	@ 3 ¢
Common, ¼¢ less than the above.		
Best Bloom Sheets, Nos. 26 to 28....	4½	@ 4½¢
Best Bloom Sheets, Nos. 22 to 25....	3½	@ 4 ¢
Best Bloom Sheets, Nos. 16 to 21....	3½	@ 3½¢
Blue Annealed.....	2.8	@ 2.8¢
Best Bloom, Galvanized, discount.....	62½	%
Common discount.....	67½	%

Merchant Steel.—The feeling in this department is a little unsettled and prices are not strictly adhered to, although as yet no change has been announced officially. Nominally quotations are as follows: Tool Steel, 8½¢ @ 8½¢; Machinery, 2.4¢ @ 2.6¢; Crucible Spring, 4½¢ @ 4½¢; Crucible Machinery, 5¢; Best Sheet Steel, 10¢; Ordinary Sheet, 8¢.

Steel Rails.—The demand has not improved and sales are mostly in small lots at about \$28 at mill. The New York Central is understood to have been in the market for several thousand tons, but it is not known what price they paid, although \$28 was quoted by mills in Eastern Pennsylvania. Freights have been more favorable from certain other points, however, as it is not thought that \$28 would be shaded for that kind of an order.

Old Rails.—There is quite a scarcity of Rails, and, while the demand is not large, prices look like going higher. In any case, holders appear to have the utmost confidence in their position, \$24.25, f. o. b. cars here, having been refused for several hundred tons to-day. Buyers are

not numerous, however, and it is only when supplies are wanted in a hurry that they will pay over \$23.25 @ \$23.50. Sales for interior deliveries are reported at from \$24 to \$25, according to circumstances.

Scrap Iron.—There is a somewhat improved demand, and while prices have not changed materially there is a better feeling, especially as regards choice qualities. Prices about as follows: \$20.50 @ \$21 for cargo lots; \$21.50 @ \$22 for carload lots, delivered, or for choice \$22.50; No. 2 do., \$14 @ \$15; Turnings, \$13 @ \$14; Old Steel Rails, \$20 @ \$21; Cast Scrap, \$15 @ \$16; do. Borings, \$9 @ \$10; Old Fish Plates, \$25 @ \$26; Old Car-Wheels, \$17 @ \$18, Philadelphia, or its equivalent.

Wrought-Iron Pipe.—There is a very heavy demand in prospect, but prices are irregular, and on special orders discounts are sometimes increased considerably. Ordinarily discounts are quoted: Black Butt-Welded, 52½ %; Galvanized do., 42½ %; Black Lap-Welded, 62½ %; Galvanized do., 52½ %; Boiler Tubes, 60%.

Nails.—A meeting of Eastern manufacturers was held in this city last Friday, but no definite arrangements were completed at that time, although efforts are still being made to agree to a plan which will yield better prices. Meanwhile prices remain as before, say \$1.90 @ \$2 from store.

Chicago.

Office of *The Iron Age*, 95 and 97 Washington street, CHICAGO, January 21, 1889.

Pig Iron.—The past week was enlivened by heavy transactions, thus realizing the expectations of those who have been predicting a more active market for this month. At the same time prices were badly broken, and thus another set of expectations was realized. The Southern element in this market is charged with the responsibility for the extremely low prices which are made, but the local furnaces held their ground and secured their share of the business. The largest contract placed was for about 10,000 tons of Coke Pig, of different grades, to be delivered through the year in monthly installments at works in Chicago and branch establishments south and east of this point. About four-fifths of this contract was secured for a Southern furnace company. The No. 1 Foundry is understood to have been sold at about the equivalent of \$16, cash, at Chicago, and correspondingly low prices were made for the other grades. To another consumer \$15.75, four months, or about \$15.25, cash, has been quoted for No. 1 Soft Southern. Up to the present time these prices are the lowest ever made at Chicago, beating the record of all previous depressions. The inference to be drawn from the occurrences of the week is that shrewd buyers now feel that the time has come to buy, as the market must be at bottom or very close to it. The establishment of such low rates must accelerate the blowing out of furnaces, being undoubtedly below the cost of production at many of them. The reported bankruptcy of one Southern furnace company is regarded here as indicating that there is a limit to Southern prices and that they cannot be pushed down much lower without disaster. Ohio Soft Irons have sold more freely, and large consumers are quietly placing contracts for their year's supply of Lake Superior Charcoal. The price of Charcoal Pig is maintained very steadily, being apparently uninfluenced by the downward course of Coke Pig. Cash quotations on ordinary purchases are about as follows, f. o. b. Chicago: Lake Superior Charcoal, \$20; American Scotch (Black-band), No. 1, \$19.50 @ \$20; No. 2

\$17.50; Jackson County Silvery, No. 1, \$18; other Ohio Soft Irons, No. 1, \$17 @ \$18; Lake Superior Coke, No. 1, \$17; No. 2, \$16; No. 3, \$15; Southern Coke, No. 1 Foundry, \$16.25 @ \$16.75; No. 2 Foundry and No. 1 Soft, \$15.25 @ \$15.75; No. 3 Foundry, \$15; Gray Forge, and No. 2 Soft, \$14.25 @ \$14.75.

Bar Iron.—More inquiry is reported, particularly from manufacturing consumers, who seem to be strongly inclined to place contracts. Quotations are about the same as they have been, ranging from 1.60¢ at Mahoning Valley mills to 1.70¢, half extras, Chicago, for mill lots of Common Bar Iron of fair quality. On good specifications these prices are shaded, but the mills seem to be fairly firm, notwithstanding their increasing anxiety to secure new business. Small lots are still quoted at 1.90¢ @ 2¢ from store, according to quantity and quality.

Structural Iron.—Matters are slowly taking shape in this line. Some bridge contracts have been placed, but orders for building material are hanging until the price of Beams is settled. It is reported that the combination price is not being adhered to by the members, and that Beams are easily procurable at 2.80¢ and lower. Some consumers assert that they will not place their orders at higher rates than 2.25¢, but this is probably a bluff. Carloads of Angles are quoted at 2.15¢ @ 2.20¢; Tees, 2.45¢ @ 2.50¢; Universal Plates, 2.15¢ @ 2.20¢, f.o.b. Chicago. Small lots of Angles bring 2.25¢; Tees, 2.70¢; Beams, 2.90¢ for foreign to 3.50¢ for domestic.

Plates, Tubes, &c.—Competition is vigorous for orders of any size, but small lots command the following prices from store: Sheet Iron, Nos. 10 to 14, 2.50¢; Sheet Steel, 3¢ @ 3.50¢; Tank Iron, 2.40¢; Tank Steel, 2.60¢ @ 2.75¢; Shell Iron, 3¢; Shell Steel, 3.12¢; Flange Iron, 4¢; Flange Steel, 3.50¢; Fire-Box Steel, 4.75¢ @ 5.75¢; Boiler Rivets, 4¢ @ 4.25¢; Uster Iron, 3.75¢. Boiler Tubes, 62½¢ off. An order for 300 to 400 tons of Tank Steel is in the market, for the new city water works.

Sheet Iron.—Manufacturers' prices are a little weaker, but jobbers still hold small lots at 3.30¢ for No. 27, 3.20¢ for Nos. 25 and 26, and 3.10¢ for No. 24. Orders for mill lots are scarce.

Galvanized Iron.—Mill prices are stiffening, and an advance is expected shortly, in consequence of the formation of the association referred to last week. Jobbers' quotations for small lots are unchanged, however, at 65 % off for Juniata and 65 % and 2½ % off for Charcoal.

Merchant Steel.—The demand is improving from small consumers, and quite a good business is reported by several houses. Mail orders are increasing considerably. Quotations are about as follows, though prices are unsettled: Bessemer Bars, 2.30¢; Tool Steel, 8.50¢ @ 9.50¢; Specials, 13¢ @ 25¢; Crucible Spring, 3.75¢; Open-Hearth Spring, 2.25¢ @ 2.50¢; Open-Hearth Machinery, 2.30¢ @ 2.40¢; Tire, 2.25 @ 2.50¢; Sheet, 7¢ @ 10¢.

Steel Rails.—Business has been very quiet, the largest order taken during the week being for 3000 tons. Inquiries are fairly numerous, and new projects are coming forward which may be carried out, if financial conditions are not too unfavorable. Prices are firm at \$30.

Old Rails and Wheels.—Old Iron Rails are very quiet. They are worth \$21.50 @ \$22 here, on a parity with other markets, but consumers are well supplied for the present, and are not disposed to pay even the lower price named. A sale of 400 tons is reported at \$24, delivered at Toledo.

Old Steel Rails in light demand and short lengths are now quoted at \$14. Sales of Old Car-Wheels are reported at \$19, but this is below the views of most holders, some of whom are willing to sell at \$19.25, while others want more.

Scrap.—Several hundred tons of No. 1 Wrought have been sold at \$20.75 @ \$21, the latter price being for a picked lot. Buyers are discriminating in their purchases of this class of material, and some lots of Scrap which would in times of activity pass readily as No. 1 are now going begging at \$19. The same remark applies to Mill Iron, a choice lot having been sold during the week at \$15.50, while the ordinary grading is worth but \$14. Cast Scrap is a drug at present, owing to the low price of Pig Iron. Mixed Country Scrap of good quality is worth \$14. Carefully selected Scrap sells at about the following prices per ton of 2000 lb: No. 1 Wrought, \$20 @ \$21; Track, \$19; No. 1 Mill, \$14 @ \$15.50; No. 2 Mill, \$10; Horseshoes, \$18.50; Axles, \$25 @ \$26; Machinery Cast, \$13.50 @ \$14; Stove Plate, \$10; Cast Borings, \$9; Wrought Turnings, \$10.50; Axle Turnings, \$13; Mixed Steel, \$11; Coil and Leaf Steel, \$15; Tires, \$15.50.

General Hardware.—Jobbers of Shelf Hardware report a very good inquiry for Nails and Barb Wire, and for spring goods generally, such as Steel Goods, Wooden-Ware, Wire Cloth, &c. Tools and Miscellaneous Hardware are moving quite freely. Traveling men are writing very encouraging letters relative to business prospects, country merchants speak hopefully of the condition of general business in their respective localities, and all signs now portend a large spring trade. Collections are very fair, showing that money is abundant. Prices are well maintained, but margins are very close on many goods now handled by the jobbing trade, compelling a larger volume of business than ever to secure a reasonable return on the capital invested. In Heavy Hardware business continues to improve, and jobbers are taking a much more cheerful view of the situation than in December.

Nails.—Manufacturers' prices are very firm for Steel Cut Nails at previous quotations, but jobbers' prices are irregular, being governed largely by circumstances. When purchased alone small lots command as high as \$2.10, but when ordered in connection with other goods they are sold down to \$2, which is very close to present cost. Wire Nails are in about the same condition, being quoted at \$2.50 @ \$2.55 in small lots and \$2.45 in mixed carloads, while manufacturers' prices are firm, with \$2.35 named as bottom for large lots. The manufacturers of Cut Nails are notifying their customers that present prices are made with no guarantee against change, and not subject to cancellation. They propose to make a radical change in the customs of the trade in this respect, and to make each sale absolute.

Barb Wire.—The demand has increased so rapidly that it now seems quite probable that manufacturers' stocks will be sufficiently depleted by the beginning of February to stiffen prices. Jobbers quote Painted at 2.90¢ and Galvanized at 3.50¢, with the usual reduction for carloads.

Pig Lead.—Sales of 300 tons are reported at 3.60¢ @ 3.65¢. The market is very quiet and steady.

Cleveland.

CLEVELAND, January 21, 1889.

Iron Ore.—The continued dullness in the Pig Iron market accounts for the delay in placing orders for new Ore. None of the numerous mining companies in this city have established their schedule of

prices for 1889. There is very little difference of opinion between the mine owners and the furnacemen as to what these prices will be, but the market is entirely without life, negotiations being confined exclusively to the odds and ends comprising the 60,000 tons of last season's Ore on the docks at Cleveland, Ashtabula and Fairport. The closing prices for last season's ore seem quite likely to be the opening prices for this year. The opinion among all interested parties in December was to the effect that substantial sales of new Ore would occur before the middle of January. Indeed, this opinion was held by both mine owners and furnacemen almost up to the day set for the opening of the market. Although nearly a week has elapsed since that time, there are no immediate indications of a buying movement. When negotiations are again resumed a vigorous demand is looked for and it would surprise no one if 2,000,000 tons of Ore were sold before March 1. About 30,000 tons of Ore have been shipped to the furnaces during the past week.

Pig Iron.—The market continues very dull, and concessions of 50¢ per ton have been made to purchasers of small lots of Bessemer Iron. Mill Irons are less affected by the apathy now existing, although sales are said to have taken place at prices from 25¢ to 50¢ below current quotations. Heavy purchasers are keeping clear of the market, as if anticipating an additional cut in prices, while the furnacemen believe a revival of former quotations and an active buying movement are sure to come within a very few days.

Old Rails.—The market gives but slight evidences of life. Old Americans at \$24 @ \$24.25 are in but slight demand.

Nails.—Steel Wire Nails have dropped to \$2.40 per keg, with no very pronounced demand even at this figure.

Later, by Telegraph.

Representatives of nearly all the mining companies in the city united this morning in the following statement: "None of the companies have fixed prices, and no direct inquiries from the furnacemen have been received. The opening of the Ore market is likely to be delayed until the middle of February. Unsold Ore on dock now amounts to less than 40,000 tons."

Cincinnati.

Office of The Iron Age, Fourth and Main Sts. (CINCINNATI, January 21, 1889.)

Pig Iron.—Another week, in which a very heavy and weak market has been continued, has closed. Cincinnati has not been alone in the whirl which has carried prices of Pig Iron down in the vortex of competition and excitement to a point at which producers can make no profit, and several concerns in the South are reported on the verge of bankruptcy—in fact, a receiver has been appointed for one furnace company, and it is rumored that similar appointments are not improbable. But this outcome has assisted the development of a more conservative feeling, or, at least, a less radical policy. At the close the market is still weak and heavy, but there is less pressure to sell at the lower prices current. It is no secret that list prices have been shaded, and No. 1 Southern Coke Foundry Iron has been sold down to \$14.75, if reliable information is to be credited. Northern, as well as Southern, Iron has shared in the general demoralization, but prices have suffered less acutely.

The volume of business during the week has been fair, but, with one exception, there has been an absence of large trades. One transaction embracing between seven and nine thousand tons of No. 1 Southern Coke Foundry Iron has been made on the basis of \$15 cash, for delivery, extend-

ing through the greater part of the year. Gray Forge has been sold at \$18 and Mottled at \$12, cash, to a moderate extent. A sale of 2000 tons No. 2 Southern Coke Foundry Iron is reported, equivalent to about \$14, cash, here, for delivery during the next 60 days. The following are the approximate prices current here at the close for cash, f.o.b.:

Foundry.		
Southern Coke, No. 1 (new classification).....	\$15.00 @	\$16.25
Southern Coke, No. 2 (new classification).....	14.50 @	14.75
Southern Coke, No. 3 (new classification).....	14.00 @	14.25
Ohio Soft Stone Coal, No. 1.....	16.00 @	17.00
Ohio Soft Stone Coal, No. 2.....	15.00 @	16.00
Mahoning and Shenango Valley.....	17.00 @	17.50
Hanging Rock Charcoal, No. 1.....	21.00 @	22.00
Hanging Rock Charcoal, No. 2.....	19.00 @	22.00
Tennessee and Alabama Charcoal, No. 1.....	18.00 @	18.50
Tennessee and Alabama Charcoal, No. 2.....	17.00 @	18.00
Forge.		
Strong Neutral Coke.....	13.00 @	13.50
Mottled Neutral Coke.....	12.00 @	12.50
Gray Forge.....	13.00 @	13.25

Car-Wheel and Malleable Irons.		
Southern Car-Wheel.....	20.00 @	25.00
Hanging Rock, Cold Blast.....	22.00 @	25.00
Lake Superior Car-Wheel and Malleable.....	21.00 @	22.00

Manufactured Iron.—There has been a fair volume of business, and under the circumstances prices have been well sustained.

Nails.—There has been a slow and an easy market, under a moderate demand and free offerings at previous prices: 12 @ 40d sell at \$1.90 @ \$1.95 $\frac{1}{2}$ keg, with 10¢ rebate in carload lots at the mills; 50 @ 60d 25¢, 10d 10¢, 8 @ 9d 25¢, 6 @ 7d 40¢, 3d \$1, and 2d \$1.50 $\frac{1}{2}$ keg more. Steel Nails sell at \$1.90 @ \$1.95, and Steel Wire Nails at \$2.60 @ \$2.65 $\frac{1}{2}$ keg.

Old Material.—An easy tone has prevailed, but prices have changed but little. Old Rails are quotable at \$22, and some sales have been made at near-by points equivalent to this rate. Old Wheels are not offered under \$19, but there are few buyers over \$18, cash.

Chattanooga.

Office of *The Iron Age*, Carter and 9th Sts., CHATTANOOGA, January 21, 1889.

Pig Iron.—The market remains stationary. In view of the large prospective increase in the Southern product this year over last, it is an open question whether prices will advance, unless some of the furnaces blow out; but, be that as it may, there are those who express the opinion very freely that Southern furnaces will continue to run at a profit, even if Iron goes \$2 or even \$3 $\frac{1}{2}$ ton lower—a decline hardly anticipated. The question of rolling stock for the transportation of Iron has again become a serious matter. In old times it was a very easy thing to get empty cars to carry north-bound freight, for the preponderance of freight was south-bound, and thousand of cars were being returned empty. Now the whole status is changed; empty cars are being called for from Northern connections, who are very reluctant to send them. The result is that the Southern lines, especially in the large manufacturing districts, choose to depend upon their own resources and such cars as they can "beg, buy or steal." The fact is that if 10,000 new cars were added to the rolling stock of the Southern lines they would not have any more than the trade demands, and the cry would soon be for more.

Miscellaneous.—General trade is good; there is no lack of orders among the manufacturers, and, what is more encouraging, there are a large number of moneyed men continually coming South with a view of investing in something or other and growing up with the country. Many parties who went in on the boom some two years ago are in that condition that

they are obliged to realize at the best figures they can get, and are unloading at reduced figures, and such opportunities are being picked up by those who have the money.

Detroit.

WILLIAM F. JARVIS & Co., under date of January 21, 1889, report as follows: The activity noted in our last report has increased, and more buying is being done than at any time for the past month. Car-Wheel Irons are the best in demand, but there is also a larger number of inquiries for Ohio Coke Irons. While prices on Lake Superior Charcoal are held firm, Coke Irons have declined 50¢ $\frac{1}{2}$ ton and some grades of Southern Iron fully \$1 $\frac{1}{2}$ ton. Although Benner still has faith in his prophecy of better prices for 1889, some few furnacemen, and a larger number of consumers, seem to doubt his trustworthiness as a prophet, and something more substantial than prophecy seems necessary to restore confidence in the market and cause prices to advance. We quote for the present as follows:

Lake Superior Charcoal, all numbers.....	\$20.00 @	\$20.50
Lake Superior Coke, all ore.....	19.50 @	20.00
Lake Superior Coke, cinder mixed.....	18.00 @	18.50
Standard Ohio Black Band.....	19.50 @	20.00
Southern No. 1.....	17.25 @	17.75
Southern Gray Forge.....	15.25 @	15.75
Southern Silvery.....	17.00 @	17.50
Jackson County (Ohio) Silvery.....	18.50 @	19.00
Old Wheels.....	20.00 @	20.50

Birmingham.

BIRMINGHAM, ALA., January 21, 1889.

Pig Iron.—There is nothing notably new in the situation here. The market is dull to the point of complaint. There is little stock on hand at any of the furnaces, all being well sold ahead. Recent sales of some off grades has created the impression that there was a material decline in Pig Iron, but it is claimed that high grades hold up fairly well, most of the companies refusing to sell for spring and summer delivery at the present prices, as they feel confident of better figures in the summer months. A prominent local Ironmaster says that not over eight or ten furnaces in the country can make Iron at a profit on the prices made by the commission merchants of the West, and as such a condition of affairs cannot last long, and the supply will soon be exhausted, better prices are to be expected. A few furnaces in the district held off, expecting better prices with Harrison's election, but had to sell at disappointing figures. All seems going smoothly in the way of operation of the big plants. It takes considerable energy to keep up the supply of Coke, but all the furnaces manage to get along. The new Thomas Furnace, No. 1, made the other day 132 tons of No. 1 Foundry Iron. They are mixing a high-grade brown Ore with their red ores. The Williamson Furnace in this city will go in blast on Tuesday, having been increased from a 40 to a 70 ton furnace.

Miscellaneous.—Business is quiet, but healthy, with the rolling mills and other minor Iron industries. Expectation of better prices, certainly by the 1st of February, keeps up hopefulness. The appointment of a receiver for the Sheffield & Birmingham Coal, Iron and Railroad Company, who own three 100-ton furnaces at Sheffield, is not regarded with any trepidation here. Inability of the company to float their securities at fair prices is given as the chief cause of the trouble, while inability to get Ore and Coke is also a well-known and admitted cause. This deficiency, however, can shortly be supplied, as both Coal and Ore are fairly convenient. It is held that the furnaces were built really before proper provision was made to supply them with material for operation.

Pittsburgh.

Office of *The Iron Age*, 77 Fourth Ave., PITTSBURGH, January 21, 1889.

Business is slow and unsatisfactory. In addition to a very light demand, prices for almost everything are being cut to such an extent that there is but little margin for profit, the natural result of an active competition. It appears to be impossible to hold together an organization to keep up prices. Manufacturers anxious for business will cut, and when a desirable order is offered it usually goes the rounds and is cut to such an extent that the successful firm in getting it has to take it at such a price that there is little or no profit. The Iron Nail, Wrought-Iron Pipe and Window Glass associations still keep up their organizations, but for the present they do not pretend to maintain uniform prices. The hitch between the natural gas companies and our manufacturers in regard to the price of gas for fuel still remains unsettled. The gas companies refuse to make any concessions, and thus the matter stands.

Pig Iron.—Since our last report there has been a further decline of 25¢ to 50¢ $\frac{1}{2}$ ton, with sales of Neutral Gray Forge at \$15 @ \$15.25, cash, and Bessemer at \$16.75, cash. Furnacemen say that they will be unable to make any further concessions in price, unless they get down the cost of production, of which there is but little prospect at present. We quote prices as follows:

Neutral Gray Forge.....	\$15.00 @	\$15.25, cash.
All Ore Mill.....	15.75 @	16.00, "
White and Mottled.....	14.50 @	14.50, "
No. 1 Foundry.....	17.25 @	17.50, "
No. 2 Foundry.....	16.50 @	16.75, "
No. 1 Charcoal Foundry.....	23.50 @	24.00, "
No. 2 Charcoal Foundry.....	21.00 @	21.50, "
Cold Blast Charcoal.....	25.00 @	28.00, "
Bessemer Iron.....	16.75 @	17.00, "

Included in the sales reported were 1000 and 500 tons Gray Forge at \$15, cash; 500 do. at \$15.25, and 500 do. at \$15.30, cash, and a small lot of Bessemer at \$16.75, cash.

Muck Bar.—The dullness noted for some time past continues, and while there have been no sales reported below \$28, cash, it is offered freely at that figure. There has been very little demand for the article for some time past, and some mills working almost exclusively on it have shut down.

Manganese.—Sale of 100 tons, 80 %, at \$56, cash; Spiegel is still quoted at \$28 @ \$28.50, cash, for 20 %.

Manufactured Iron.—Demand continues light, and there is reason to believe that desirable orders could be placed below our quotations; it is expected, however that orders will commence to come forward more freely within the next few weeks. In addition to the regular merchant trade it is expected that there will be a good demand for all the leading specialties. We repeat former quotations: 1.75¢ @ 1.80¢ for Bars; Plates, 2.20¢ @ 2.25¢; No. 24 Sheet, 2.85¢ @ 2.90¢, all 60 days, 2 % off for cash. Skelp Iron is quoted at 1.80¢ @ 1.85¢ for Grooved, and 1.95¢ @ 2¢ for Sheared.

Nails.—There is no change to note in the situation here; business continues extremely dull, and no improvement can be looked for as long as Wheeling undersells us 10¢ $\frac{1}{2}$ keg. The Wheeling card is \$1.80, while Pittsburgh is \$1.90, 60 days, 2 % off for cash.

Old Rails.—The market continues very dull, and in the absence of sales it is difficult to give reliable quotations. Consumers continue to hold off, buying only as their immediate actual necessities require, and until they have some assurance that hard pan has been reached it is not likely that they will anticipate future wants. American Tees could no doubt be had at \$24, and possibly for less, but so far as we can learn these have not been

offered below that price. It is only within the last few days that the weather has been so severe as to suspend the work of lifting, and if it should hold out any length of time the offerings will of necessity fall off.

Wrought-Iron Pipe.—There is a fair business for this season of the year, but it is complained that there is no profit at the prices ruling, and in this latter respect there is but little prospect of any immediate improvement. Discounts on Black Butt-Welded Pipe, 52½ and 5¢; on Galvanized do., 45 and 5¢; on Black Lap-Welded, 62½¢; on Galvanized do., 52½¢; Boiler Tubes, 65 and 5¢; 2-inch Tubing, 13¢ per foot, net; 5½-inch Casing, 35¢ per foot, net.

Steel Rails.—There appears to have been no change in the market here during the past week; \$28, cash, is still the ruling price for lots ranging from 1000 up to 5000 tons. We are advised of a sale of 2000 tons at the price quoted. It is probable, however, that for large orders, say, 10,000, 15,000 or 20,000 tons, the price quoted would be discounted.

Billets, &c.—Bessemer Steel Billets are still reported dull and weak; quoted at \$28 @ \$28.25; Bessemer Steel Nail Slabs, \$27.75 @ \$28; Domestic Blooms and Rail Ends, \$18.50 @ \$19. No sales reported recently, and the market is weaker.

Railway Track Supplies.—Demand reported light, while prices remain unchanged. Spikes 2¢, 30 days, for Pittsburgh; Splice Bars, 1.80¢ @ 1.85¢; Track Bolts, 2.80¢ with Square and 2.90¢ with Hexagon Nuts.

Merchant Steel.—Prices remain unchanged, Tool Steel standard brands, 84¢; Crucible Spring, 44¢; Crucible Machinery, 5¢; Open Hearth do., 24¢.

Old Material.—Demand continues light and prices weaker; No. 1 Wrought Scrap, \$21.00, Wrought Turnings, \$18 @ \$18.50; Car Axles, \$25 @ \$25.50; Cast Scrap, \$15.50 @ 16, gross; Cast Borings, \$12 @ \$13; Old Car Wheels, \$19 @ \$19.50, gross; Old Steel Rails \$18.50 for short, and \$20 for long lengths.

The partnership heretofore existing between G. Getty Stuart and F. W. McLean, under the title of Stuart & McLean, Iron and Steel Factors, Hamilton Building, Pittsburgh, Pa., was dissolved on the 1st inst. by the retirement of G. Getty Stuart. The business will be continued by the remaining partner, Frank W. McLean, Iron and Steel Factor, Hamilton Building, Pittsburgh, Pa.

Louisville.

LOUISVILLE, KY., January 21, 1889.

The market has remained steady during the last week, though prices have been very low. Several of the furnaces that were willing to sell have now placed what Iron they desired to offer for the next few months, and there is not the same amount of Iron being offered. Buyers, however, are able to have their wants supplied, especially for short deliveries.

All furnaces are not willing to sell for future shipment, but are holding back, preferring to accumulate Iron until the market is better, or if necessary, go out of blast rather than sell at present prices. There has been a fair amount of Iron bought, and in all cases at low figures, parties believing it is wise to buy for future consumption all the Iron they will need during the coming year at ruling figures. We quote as follows:

Southern Coke, No. 1 Foundry, new classification, \$15.00 @ \$15.50
Southern Coke, No. 2 Foundry, new classification, 14.50 @ 15.00
Southern Coke, No. 3 Foundry, new classification, 14.00 @ 14.50
Gray Forge, new classification, 13.50 @ 14.00
White and Mottled, different grades, 13.00 @ 13.50

Silver Gray, different grades, 13.25 @ 14.00
Southern Charcoal, No. 1 Foundry, 13.50 @ 17.00
No. 1 Mill, 15.00 @ 15.50
Southern Car-Wheel, standard brands, 22.00 @ 23.00
Southern Car-Wheel, other brands, 18.25 @ 19.75
Hanging Rock Coke, No. 1 Foundry, 15.75 @ 16.25
Hanging Rock Charcoal, No. 1 Foundry, 19.75 @ 21.25
Hanging Rock, Cold Blast, 21.00 @ 24.00

New York.

Office of *The Iron Age*, 66 and 68 Duane street.
NEW YORK, January 23, 1889.

Foundry Pig.—Our local market has not been as deeply disturbed as have been those of the West, from which, however, come well-authenticated reports of very low sales, which cannot help having a sharp influence upon the trade here. The aggressors in the West have been some of the Alabama companies. Business has been done in Cincinnati at \$14.75 for No. 1 Southern Foundry, and in Chicago at \$16. This is equivalent to \$12 at Birmingham for both. We should add that these prices have only been made in isolated cases thus far, that other leading companies have declined to meet them, and that buyers have promptly taken hold at the figures named. It remains to be seen whether they are at all likely to become general. But it must be remembered that if they do they establish a distinctly lower level in Philadelphia and here, in spite of the delays of shipments by regular routes to these points. In other words, on the basis of a Birmingham selling price of, say, \$12 for No. 1 Foundry, the Iron can be put into Philadelphia by all-rail, avoiding all delays at Savannah, at \$4.50, making the delivered price \$16.50, while for New York the figure would be \$17. By steamer the figure is \$16 in both cases. Southern Iron shipped by steamer has been offered here during the past week at \$16.75 for No. 1. If the cut in the West initiated by a few should become general, which it has not as yet, the low figures named could be made without any dependence whatever on the mercy of the steamship lines. It seems clear that under such circumstances \$17 for standard brands of Northern Iron would not be a low price, and, unless affairs take a sudden turn for the better, that figure will become the opening price, unless even a greater cut is deemed expedient. There seems little doubt that production at the present rate is in excess of current consumption. Reports from consumers are conflicting. A good many of the smaller foundries are very busy, but some of the larger concerns are doing little. The immediate outlook for many furnaces is very discouraging and indicates that it would be wisest to blow out if the plant is not running to best advantage or cost can be materially reduced, which is probably the case in only a few instances. Iron makers in Eastern Pennsylvania have had additional burdens placed upon them by advances in freights, early in the month, to New England points by all-rail. They have sought some relief by shipping to tidewater and forwarding by vessel to the nearest New England port. Off grade Irons are reported to be weak.

Scotch Pig.—The market is quiet at unchanged quotations. Coltness, \$20.50 @ \$21; Shotts, \$20 @ \$20.50; Langloan, \$20 @ \$20.25, Summerlee, \$20.25 @ \$20.50 and Dalmellington, \$19.25 @ \$19.50.

Spiegeleisen.—No business is reported, the high prices asked causing buyers to hold off and take their chances of the future. We quote \$28 @ \$29 for 20 % English.

Plates.—We quote Iron Tank, 2¢ @ 2.2¢; Shell, 2.35¢ @ 2.4¢; Steel Tank and Ship Plate, 2.15¢ @ 2.25¢; Shell, 2.35¢ @ 2.5¢; Flange, 2.6¢ @ 2.75¢, and Fire-box, 3½¢ @ 4¢.

Structural Iron.—The sensational reports of a rupture in the Beam Association printed in the daily newspapers are without any foundation whatever. A meeting was held at Philadelphia, on Monday, to perfect certain details which could not be settled at the New York meeting, because some of the leading manufacturers were forced to leave for their homes. The principal point taken up at Philadelphia was to give the makers the option to sell Plate Girders at 2.8¢, instead of holding to 3.3¢, as heretofore. We quote Sheared Plates, 1.9¢ @ 2¢; Universal Mill Plates, 2¢ @ 2.1¢; Angles, 2¢ @ 2.10¢; Tees, 2.5¢ @ 2.6¢, and Channels and Beams, 2.8¢ on dock for all sizes.

Bar Iron.—The market is weak. We quote: Carload lots on dock, half extras, Common, 1.65¢ @ 1.75¢; Medium, 1.75¢ @ 1.8¢, and Refined, 1.8¢ @ 2¢.

Steel Rails.—Sales reported by Eastern mills foot up to about 16,000 tons, of which 10,000 tons were taken by a New England road from two Eastern Pennsylvania mills. We note also a lot of about 2500 tons for the Pacific Coast. At this writing probably a 6000-ton order for a Virginia road has been closed, as also a 7000-ton lot by an Illinois road, Chicago delivery. There are orders in the market for the South, and some large business is being talked of for Pacific Coast delivery. Prices at Eastern mill remain the same. It is difficult to quote, each individual order being largely dependent upon the chances of low freight rates by one or more mills. We quote nominally \$27.50 @ \$28 at Eastern mill. An error crept into our table of the shipments of the different mills published last week. We give below the correct figures for 1888:

	Gross tons.
North Chicago Rolling Mill Company	161,945
Carnegie Bros. & Co	188,946
Scranton Steel Company	186,029
Lackawanna Coal and Iron Company	128,310
Union Steel Company	126,016
Pennsylvania Steel Company	121,960
Joliet Steel Company	114,675
Bethlehem Iron Company	85,448
Cambria Iron Company	82,363
Western Steel Company (former lessees)	39,168
Cleveland Rolling Mill Company	29,940
Troy Steel and Iron Company	25,110
Worcester Steel Company	6,569
Springfield Iron Company	3,705
Total	1,200,184

It will be understood that these are the shipments of the different concerns in the year 1888 of Rails weighing 50 lb to the yard and upward, as reported to the Board of Control. James M. Swank, secretary of the American Iron and Steel Association, officially reports the total production of all Steel Rails, including Light Rails at 1,364,337 gross tons. So far as we have been able to ascertain it, the position of the different mills at this writing is: North Chicago, Carnegie, Lackawanna, Pennsylvania, Cambria and Joliet are running, some of them light, and only one, or possibly two, at full capacity. Scranton and Bethlehem are temporarily idle. The others are closed down for an indefinite period. Even among the small number of active mills, some important concerns are not by any means eager sellers. Mills, both on the active list and some who have stopped making Rails, are giving considerable attention to the Billet and Slab trade, and are working on specialties. The market has, therefore, narrowed down very considerably, and the sellers may be classed in three groups—those of Eastern Pennsylvania, including the Bethlehem, the Pennsylvania and the two Scranton mills; the three of the Pittsburgh-Johnstown district, which are Carnegie, Cambria, and the Allegheny, and the three Chicago mills who are acting in harmony. Among these at least three, all of them large works, have practically sold their allotment, or are

very near it, which means that they have six months' work or more on their order books, if they make as much or more even than they did last year. Since the smaller mills are confessedly unable to meet present prices, and a number of the larger works are indifferent about meeting them, being fairly well employed in other directions, it is reasonable to suppose that little can be gained by buyers by holding off. It is not claimed that any sharp advance is probable in the near future, but from our review of the situation the inference seems logical that no further decline is probable, but that, on the contrary, a stiffening is not impossible in the near future. The only uncertain factor is the new mill, which may or may not be eager for business a little later on. Its influence is not likely to be as deeply felt then as it was two months ago, because then the number of contestants for business was considerably larger. While certainly not bright, the outlook is far from being as dark as many seem inclined to regard it.

Wire Rods.—Only a very small business has been done in foreign Rods at \$41.50, which we quote. We note also a sale of 500 tons of domestic Rods by an Eastern Rod mill to a Wire mill at the reported price of \$41.50, delivered at buyer's works.

Old Rails.—The only sales reported are one lot of foreign Tees of 500 tons at a price equivalent to \$23.50, Jersey City, and a small lot of 150 tons to a mill in Eastern Pennsylvania. A lot of 500 tons foreign, in store, is being offered at \$23. There is some demand, and holders continue firm on what little supply there is. We quote \$23 @ \$23.50.

Scrap Iron.—The market is dull, only few sales being reported. The bulk of the arrivals lately have been mixed lots which have sold at \$18. No. 1 Wrought, at yard, is quoted \$20 @ \$20.50.

Track Material.—Spikes are very weak, being readily obtainable, for large quantities, at \$2.05 @ \$2.10. It is intimated even that business has been done at less. We quote Angles at 1.85¢ @ 1.90¢.

Metal Market.

Copper.—Since our last report Spot Chili Bars and Good Merchantable declined from £77. 17/6 to £77. 7/6, futures remaining unaltered, £78, and Best Selected, £79 10/. Sales for the week, 500 tons. In this market the sales were limited to 25,000 lb. January, at 17.20¢, and 25,000 lb. March, at 17.25¢. The quotation of Lake, which the syndicate sells consumers, is, as heretofore, 16 1/4¢, casting brands sell at 15 1/4¢ @ 16 1/4¢. In Philadelphia the latter are locally selling at considerably less than 16¢. The market is altogether featureless and awakens little interest among the trade. During the first ten months of 1888 the Spanish export of Pyrites amounted to 699,838 tons, as compared with 650,535 in 1887 and 574,285 in 1886; of Precipitate it was 24,152 tons, against 23,825 and 23,378.

Tin.—A further decline has taken place in the London market in spot Straits from £98. 2/6 a week ago to £97 this morning, and in futures from £98. 12/6 to £97. 10/. Sales, 510 tons. Our own Exchange has exhibited a little more activity, the tendency being drooping all along in response to the London decline. Some 60 tons were sold, March from 21.75¢ down to 21.70¢, April from 21.95¢ to 21.80¢, and finally February at 21.65¢. The best obtainable for spot is now 21.50¢, and for 5-ton lots 21.70¢ is asked, spot being held at 21 1/4¢ at the close. The entire situation lacks vitality and excites little interest among bona fide dealers owing to the light consump-

tive demand. Messrs. Gilfillan, Wood & Co., Singapore, cable to their agent, Mr. Chas. Nordhaus, 89 Water street, New York, January 17, that the shipments this way first half of January were 300 tons, against 150 in 1888, and to England 600, against 1400. In piculs they were this way first 11 months of 1888, 55,072, against 69,570 in 1887, 66,873 in 1886, 37,058 in 1885, 55,279 in 1884, and 106,231 in 1883. Rains are impeding receipts from the interior of the Peninsula. **Tin Plates.**—The market has been steady, with a light consumptive demand. A moderate business has been doing in futures, without change in price. Makers in Wales hold prices steadily; there is a difference of 2 1/4 to 5¢ per box between buyers and sellers. We quote, large lines, per box; Siemens-Martin Steel, Charcoal Finish, \$4.75 @ \$5.50; Coke Finish, \$4.65 @ \$4.70; Terns \$4.12 1/2 @ \$4.25; Coke Tins, \$4.22 1/2 @ \$4.30, and Wasters, \$4.12 1/2 @ \$4.15. Liverpool Coke rules 13 to 13/3.

Lead.—All that was sold in the open market in the city during the week under review was 600 tons, at 3.85¢ down to 3.80¢, which is the closing quotation on a flat market. The Western markets ranged from 3.60¢ down to 3.55¢. Sales of a few carload lots at the Exchange were made to-day at 3.80¢ for January and 3.85¢ @ 3.87 1/2¢ for March delivery. Soft Spanish has not changed from £12. 17/6, but English Pig gave way from £13. 7/6 to £13. 5. Spanish export of Pig Lead has been, during the first ten months of last year, 109,212 tons, against same time in 1887 111,357 tons, and 94,097 in 1886.

Spelter.—Has been decidedly firmer at 5¢ for Common Domestic because of greater scarcity. Out West more has been done, consumers laying in a stock to last them a couple of months, and the market out there rules stiffer. Silesian is neglected for the moment at 5.87 1/2¢ @ 5.90¢, nominally, not varying from £18. 7/6 in London. In Europe the International Syndicate may be considered virtually renewed for three and a half years to date from July 1 next, with the additional strength that a few makers who had hitherto not joined the same have now done so. Spanish Calamine export during the first ten months of last year has been 24,361 tons, against 21,473 same time in 1887 and 22,497 in 1886.

Antimony.—A brisk demand has been noticeable during the week, for Cookson in particular, which is extremely scarce, and cannot be quoted less than 13¢ @ 13 1/4¢, while Hallett commands 11¢ @ 11 1/4¢, remaining £45 in London.

New York Metal Exchange.

The following sales are reported:

THURSDAY, January 17.	
10 tons Tin, April	21.95¢
10 tons Tin, April	22.00¢
FRIDAY, January 18.	
10 tons Tin, March	21.75¢
SATURDAY, January 19.	
10 tons Tin, March	21.70¢
MONDAY, January 21.	
10 tons Tin, April	21.80¢
25,000 lb Lake Copper, March	17.25¢
TUESDAY, January 22.	
10 tons Tin, February	21.65¢
25,000 lb Lake Copper, January	17.20¢
WEDNESDAY, January 23.	
16 tons Lead, January	3.80¢
16 tons Lead, March	3.85¢
32 tons Lead, March	3.87 1/2¢

Coal Market.

Lugubrious accounts are received from the Coal trade in both branches, Anthracite and Bituminous alike, in the absence of anything approaching zero weather. The complaint is of a sluggish demand,

quite disproportioned to the receipts from the mines, and this despite the combined efforts to retard production, which for the week ended 19th inst. amounted to 604,000 tons, a decrease of 36,000 tons compared with the previous week, but 42,000 tons in excess of the corresponding week in 1888. Since January 1 the aggregate is 1,669,990 tons, against 1,705,772 for the same time last year, a decrease of 35,000 tons. Prices are upheld with tolerable success by the companies, who recognize no change in quotations, but individuals cut freely at about 25¢ per ton off. Even at cut rates it is said that Coal moves sluggishly. Shipping points are well stocked and at Western points there is too much accumulation to please the holders. Quotations are: Hard White Ash, Lump, \$4.50; Broken, \$4.15; Egg, \$4.40; Stove, \$4.65; Chestnut, \$4.55; Free-Burning, f.o.b., Broken, \$3.95; Egg, \$4.30; Stove and Chestnut, \$4.65; Pea, \$2.75.

Freights eastward are weak at \$1.15 and discharge from New York to Boston.

The case of Cox Bros. against the Lehigh Valley Railroad on the charge of discriminating is postponed to February 7. The company have decided to remove their New York headquarters to the Equitable Building.

In the Bituminous trade there is no change.

The Anthracite Coal tonnage for 1888, as compiled by John H. Jones, Chief of the Bureau of Anthracite Coal Statistics, shows that 38,145,718.04 tons were mined, as compared with 34,641,017.15 in 1887. For December the production was 2,703,923.02 tons, against 3,068,078.12 in 1887. The detailed statement for the year follows:

	1888.	1887.
Phila. and Reading	7,175,096.08	7,556,251.13
Lehigh Valley	6,562,715.14	5,784,450.11
Central R. R. of N. J.	5,742,279.03	4,852,559.01
Del., Lack. and West.	6,996,192.00	6,220,702.12
Del. and Hud. Cl. Co.	4,436,188.05	4,046,230.06
Pennsylvania	4,554,440.10	3,516,143.05
Penna. Coal Co.	1,624,438.06	1,803,455.18
N. Y. L. E., and W.	974,373.10	750,834.12
Total	38,145,718.04	34,641,017.15

The product of the three regions was: Wyoming, 21,852,365 tons in 1888, as compared with 19,684,928.15 in 1887; Lehigh, 5,639,236 in 1888, as compared with 4,347,061 in 1887; Schuylkill, 10,654,116 in 1888, as compared with 10,609,027 in 1887. The stock of Coal on hand at tide-water shipping points, December 31, 1888, was 652,156 tons, as compared with 569,233 tons on November 30, and 130,977 tons on December 31, 1887.

The Eastern competitive tonnage, including all Coal which for final consumption or in transit reaches any point on the Hudson River, or the Bay of New York, or which passes out of the capes of the Delaware, was: 1888, 13,657,604 tons; 1887, 12,081,826 tons.

Financial.

Uninterrupted transportation has been remarkably favorable to the movement of merchandise, but since the advance in rates under the recent agreement of railroad presidents and bankers a check is observed in several channels. This is especially noticeable in east-bound shipments from Chicago, which are not one-half of what they were prior to December 17, when former contracts expired. Aside from this influence, as concerns the grain trade, the barge lines on the Mississippi River are competing sharply, to the detriment of railway earnings. Despite this exceptional feature, trade movements in the aggregate contrast favorably with one year ago, as indicated by bank clearances in nearly all leading points. For the week ending January 19 the total shows a gain of 22%. In New York the increase is 25.7%; outside of New York, 15.9%. The improvement is very general,

Boston and Philadelphia not excepted. Points in the Northwest, as usual, show the largest percentage of increase. Denver leads all, with a gain of 56.5 %, and there is more than usual activity in Cincinnati, Milwaukee and Cleveland. St. Paul reports only 4.2 %, against 29.3 % for Minneapolis. Other favorable features are a very substantial improvement in exports, particularly in cotton and provisions; important progress in measures for settling railroad troubles on a permanent basis, and a steady augmentation of bank reserves.

The weekly statement of the city banks was again favorable, showing an increase of \$3,480,400 in the surplus reserve, which now amounts to \$18,029,550, against \$20,914,475 at the corresponding time last year, and \$18,796,375 in the third week of January, 1887. The surplus has thus doubled within a few weeks, placing the banks in a position to meet any drain from a renewal of gold exports, which some bankers regard as more than probable. Loans increased \$3,000,000; specie, \$3,518,000; legal tenders, \$1,639,400; deposits, \$6,750,000. In the West money is in demand. In Wall street money is in abundant supply at about 2½ % on call, with a limited demand. Excepting banks and trust companies, lenders were less particular respecting the character of collaterals, but are looking for better rates in March. First-class paper is quoted 2½ % at 60 days, and 3½ @ 4 % four to six months. In bank stocks, 10 shares of Continental sold at 129, and 35 shares of Commerce at 182.

A statement prepared by the actuary of the Treasury Department shows actual prices of United States bonds during the last two months, and rates of interest accruing to purchasers who buy at present rates and hold the bonds until they mature. It shows that 4 % bonds maturing July 1, 1907, selling at average of 127.9, realize 2.2 % per annum. The 4½s maturing September 1, 1891, sell at 108.7 and realize but 1.06 interest.

Trade circles are quiet. Prices of Wheat have receded about 2¢ a bushel. Dairy stocks, apples and potatoes have suffered from unseasonable weather, and in some instances shippers have suffered severely. Provisions are all on the downward move. Coffee has gained on the basis of crop reports, and groceries generally are tame. The principal feature was the opening dealings on the new crop of Cuba molasses. Exports of provisions from all Atlantic ports last week were 13,946,161 lb bacon, 9,953,221 lb lard, and 5227 barrels pork, a heavy gain on the corresponding time last year. The outlook in all directions for trade in dry goods appears to be favorable for both the spring and fall season. Charleston reports a cotton crop that will approximate, if it does not reach, the magnificent total of 7,500,000 bales.

The Stock Exchange markets drooped, influenced by the passing of the dividend on Atchison, Topeka and Santa Fé, which declined over two points on Thursday, and caused a weakness in other Southwestern shares, more materially Rock Island and Missouri Pacific. Bear raids were the chief source of disturbance. On Saturday Atchison was again the feature. The favorable bank statement caused an improvement, but in the final dealings Atchison was again broken down. A further decline in this stock on Monday had an unsettling effect. The grangers were favorably influenced by reports that a meeting of railroad presidents would be held on Thursday, at which steps would be taken for the organization of the Interstate Railway Association. On Tuesday news of the engagement of \$500,000 gold for shipment encouraged the bears, and the market was irregular at the close.

The Trunk Line presidents, at a meeting in Commissioner Fink's office, passed resolutions recognizing the agreement of the Western presidents.

The market for sterling is strong, owing to the continued scarcity of commercial bills, and brokers advanced their posted rates to \$4.86½ @ \$4.89½. Hopes are entertained that the decline in wheat will go far enough to permit a freer outward movement of breadstuffs, but English prices are about 25¢ under American wheat, and similar conditions prevail in France. At present foreigners are not buying our stocks and bonds. The London *Economist* doubts the wisdom of the recent reduction of the bank rate to 4 %, as the South American demand for gold has been suppressed rather than satisfied, and there are other demands that are believed to have been kept in abeyance because of the higher rates for money that recently obtained.

The December statement of the export of breadstuffs from the United States presents some curious and interesting features. The total money value of the shipments was \$10,155,796, or only \$214,798 less than in 1887. Exports of wheat were curtailed by the high prices then prevailing, but, despite a falling off of 306,684 bushels, the money value was \$59,000 greater than in 1887. There was a decrease in the exports of flour from 1,171,365 barrels in 1887 to 698,613 barrels in 1888. On the other hand, the shipments of corn increased to the extent of \$1,408,277.

According to the Custom House report the exports of specie from this port during the week were \$431,000, making a total of \$1,219,000 since January 1, as compared with \$939,000 for the same time in 1888. The imports of specie for the week were \$220,000.

Nine removals from the appraiser's office were announced, as the result of the investigations of the special Treasury agents in the sugar, wool, hardware, tobacco and damage allowance divisions.

The New York Cotton Exchange has mortgaged its property at Hanover square and William street to the Mutual Benefit Life Insurance Company, of Newark, New Jersey, for a loan of \$310,000, payable in five years. The New York Board of Trade and Transportation elected Ambrose Snow, president; Gardner R. Colby, George L. Pease and James H. Seymour, vice-presidents; Darwin R. James, Secretary, and John C. Cook, treasurer. The annual election of officers at the Coffee Exchange, resulted in the success of the regular ticket for the principal officers. There was an exciting contest, however, over the Board of Managers, and the opposition ticket was carried by a decisive majority.

The imports of merchandise at this port during the week were valued at \$9,161,000, of which \$2,628,000, represents dry goods. Since January 1 the total is \$30,288,320, against \$28,012,00 for the same time last year and \$25,402,000 in 1887.

British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, January 23, 1889.

Chili Bar Copper for prompt delivery has ruled a shade lower. The demand for covering of "short" sales has not met expectations, and outside holders who were disposed to realize had to do so at a loss. Prices for futures are held firmly. There were no deliveries of Chili Bars during the first half of the current month, and the demand from consumers the past week has been very small as well. Furnace Material also

remains dull. A sale is reported of 340 tons American Ore at 14/4½ at Liverpool. Nothing new has developed as regards the "Copper Bank," or the rumored English syndicate. The turnover of Bars in a speculative way the past week is estimated at 800 to 900 tons.

Block Tin has declined about £1 during the week, apparently under pressure from the large operators, who are suspected of manipulating the market with a view of forcing outsiders to part with their holdings. The latter have sold with some freedom because of the cheerless aspect and express surprise at the languid condition of the market. Probably 600 to 700 tons have changed hands during the week.

Tin-Plate makers report a better demand, and in some instances call the market active. The majority are fairly well sold ahead, and, therefore, firm on prices. Stocks at the shipping ports are of larger total now than a year ago. The Ashburnham Company are erecting a new works at Carmarthen.

An improved demand is reported for Wrought Scrap Iron, and the fact is ascertained that the stock here of desirable lots is comparatively small. There is, however, no improvement in the demand for Old Iron Rails.

No new facts come to the surface regarding the proposed combination of Steel-Rail manufacturers, and the presumption is that organization has not yet been completed.

There has been very little change in the course of trade in Pig Iron, Manufactured Iron or Steel the past week, and the variations in prices are slight. Billets and Wire Rods are offered at 1/3 under the figures previously asked, and some brands of Scotch Pig are 6d off.

Scotch Pig.—There has been a fairly active business at about last week's prices.

No. 1 Coltness, f.o.b. Glasgow	50/6
No. 1 Summerlee, " "	50/
No. 1 Gartsherrie, " "	48/6
No. 1 Langloan, " "	49/6
No. 1 Carnbroe, " "	48/6
No. 1 Shotts, " at Leith	49/6
No. 1 Glengarnock, " Ardrossan	47/6
No. 1 Dalmellington, " "	48/
No. 1 Eglinton, " "	47/6
Steamer freights, Glasgow to New York, 3/6	
Liverpool to New York, 10/.	

Cleveland Pig.—Demand has been slow and prices are a trifle weak. No. 1 Middlesboro', G. M. B., 36/; No. 3 do., 33/6.

Bessemer Pig.—A good trade still reported with prices steady. West Coast brands, mixed numbers, 45/, f.o.b. shipping point.

Spiegeleisen.—The market remains very firm and is fairly active. English 20 % quoted 80/, f.o.b. N. W. England shipping point.

Steel Rails.—Demand continues brisk and the market strong. Heavy sections quoted at £3. 19/6 @ £4, and light sections £4. 2/6 @ £4. 12/6, f.o.b. at N. W. England shipping point.

Steel Blooms.—Very little doing in these at the moment. We quote £3. 18/6 for 7 x 7, f.o.b. at N. W. England shipping point.

Steel Billets.—The demand moderately active and sellers very firm. Bessemer, 2½ x 2½ inch, £4. 5/, f.o.b. at N. W. England shipping point.

Steel Slabs.—A fair business passing at firm prices. Bessemer, £3. 18/6, f.o.b. at N. W. England shipping point.

Hardware.

There is some movement in trade and indications of a fair business at an early day. Prices are without important change. While some lines are somewhat firmer, the general tone of the market is not strong, but most leading goods are held at about the figures which have recently prevailed.

Cut Nails.

The market has gained in strength, but prices are not notably higher, although cutting is now reduced to a minimum. We continue to quote carload lots \$1.80 @ \$1.90.

At the meeting of the Eastern Nail manufacturers held at Philadelphia last week no final conclusion was arrived at in regard to the plan proposed. The meeting adjourned subject to the call of the committee, which is elaborating some details.

Wire Nails.

During the past two or three weeks large quantities of Wire Nails have been sold at prices which have varied considerably according to the circumstances, some of the Nails having been purchased at considerably lower quotations than are now obtainable. Several of the leading manufacturers are well supplied with orders, and for this reason are holding prices a little more firmly, while the extremely low quotations made have been withdrawn. The market is consequently in a somewhat better condition, more from the causes mentioned than from any agreement reached by the manufacturers, between whom the competition still continues animated. The price at factory remains about \$2.30 in carload lots, the price from store being \$2.50 to \$2.60.

Barb Wire.

A meeting of the manufacturers of Barbed Wire of St. Louis was held in that city on the 9th inst. A review of the past six months' trade, as admitted by the different manufacturers present, proved anything but satisfactory; on the contrary, it was intimated that the way prices had been cut the business had proved unremunerative, and the only solution of the problem was to make a list of prices and strictly adhere to them. In accordance with this decision it was decided to ask the co-operation of Oliver & Roberts Wire Co., Pittsburgh, Pa., in maintaining the following prices, which was readily obtained. Below will be found prices, which are to continue until further notice: To the in car lots, two or four Point trade, Painted, \$2.90, with 60 cents advance for Galvanized. Less than car-lots, 5 cents above this price. The matter of an advance in Texas freight rates was also carefully discussed, and it was deemed essential and was agreed, that where goods were to be delivered to common points in Texas, with a 63-cent tariff, the price will be \$3.50 for Painted, and \$4.10 for Galvanized. To other points in Texas, where the tariff is over 63 cents, add such excess to the above delivered price. There was the utmost harmony existing in the meeting; every representative fully realized the necessity of adopting the above prices, and also the importance of adhering strictly to them. The St. Louis manufacturers were all represented, namely:

THE FREEMAN WIRE COMPANY,
ST. LOUIS WIRE MILL COMPANY,
AMERICAN BARBED WIRE COMPANY, and
CONTINENTAL WIRE COMPANY

Miscellaneous Prices.

The manufacturers of Picks and Mattocks are conferring with reference to prices, which are characterized as unsatisfactorily low, and they are considering the

feasibility of making an advance, and for deciding this question a meeting will be held at an early day.

The Rope market is without new features, the supply of raw material continuing exceedingly meager, and prices being firmly maintained, as at our last report. The manufacturers of Jute Rope are following the advances made in Manila and Sisal, and have recently named higher prices.

The Sand Paper market is in an exceedingly unsatisfactory condition and characterized by considerable irregularity. Lower prices than were named by the leading houses at the breaking up of the combination are now obtainable, and some makers occupying a less prominent position are making some very low quotations.

The Scythe market is quite active, and a good many orders are being booked. Prices are referred to as unreasonably low, and competition is animated. In the condition of the market it is not thought that they will recede, and it is not unlikely that they may become stronger with the progress of the season.

The Boston & Lockport Block Company, Lockport, N. Y., call attention to a new pattern Wood Metal-Plug Faucet, designated the Star. It is referred to as designed to meet a want for a superior article of this kind, and is described as extra large in size, and having a malleable shank for handle, which gives it the required great strength. At present four sizes are ready for the market, namely, 8, 10, 12 and 18 inch, and they will be so numbered. The prices are: 8-inch, \$3; 10-inch \$4; 12-inch, \$5; and 18-inch, \$6 per dozen, subject to a discount of 40 per cent.

The advance from 5 to 10 per cent. in the prices of Tinned and Enameled Hollow-Ware, to which we referred in our last issue, was made by the concerted action of the leading manufacturers, and is being regularly maintained. The prices that previously prevailed were unprofitably low, and this advance will be accepted as reasonable and satisfactory.

The Jobbing Trade.

Concerning this matter we have the following letter from a house in Iowa. It is an exceedingly satisfactory presentation of the case and shows clearly the necessity for the jobber and the important position he occupies in the distribution of Hardware:

I have read with much interest the reports from various parts of the country on the tendencies in trade. I observe that in the reports from retail dealers those in the Eastern States report more generally a disposition to buy direct from the manufacturers than the retail dealers of the Western States. The presumption is that, being in closer proximity to the manufacturers, their orders may be sent to them and be filled with ordinary promptness—more so than could be depended on by Western retailers on account of the long distance between the Eastern manufacturers and the Western retailer, the great majority of Iron Goods manufacturers being as yet east of the lakes. In the Western States the disposition of retail dealers, so far as heard from in your paper, shows a preference for trading with the wholesaler. In these "last days" of quick sales and small profits the retailer must turn his goods over quickly—in fact, either wholesaler or retailer must turn his goods over quickly, or several times a year, or he will, ere many years, have no goods to turn over. The retailer west of the Mississippi River desiring to replenish his stock with a variety of articles may send an order to any of the jobbing houses on the Mississippi River, have his order

filled, shipped and in his house, and part of the goods out in the hands of his customers, before the order would likely be filled at the factory. Let us suppose a case as an illustration. A retail dealer in any one of the prairie States wishes to send an order to replenish with, say:

25 kegs Cut Steel Nails,
25 kegs of Wire Nails,
5 kegs of Burden's Horse Shoes,
5 kegs of Perkins' Snow Shoes,
3 boxes of Northwestern Horse Shoe Nails,
3 boxes of Star Horse Shoe Nails,
3 boxes C. B. K. Horse Nails,
3 boxes Ausable Horse Nails (as he must keep all brands to suit the peculiarity of various customers),
10 dozen Strap and T-Hinges,
1/2 gross Butt Hinges,
10 gross Wood Screws (assorted sizes),
2000 Common Carriage Bolts,
500 Norway Carriage Bolts,
3 dozen Files,
1/2 dozen Horse Rasps,
1 ton Barbed Fence Wire,
1/2 ton Plain Baling Wire,
5 bundles of Stove-Pipe Sheet Iron,
3 bundles Galvanized Sheet Iron,
1/2 dozen Coal Hods,
1 Finished Cutter,

and a limited quantity of articles too numerous to mention. Now, he may send either to St. Louis, Burlington, Dubuque or St. Paul on the Mississippi River and find all the above articles in one house and ready for shipment same day as received.

Suppose now he desires to deal with the manufacturer direct: For his Cut Nails he sends an order to Wheeling or Pittsburgh; for Wire Nails to Cincinnati, Salem or Newcastle; for Burden's Horse Shoes to Troy, N. Y.; for Perkins' Snow Shoes to Providence, R. I.; for Northwestern and Star Nails to Chicago; for Putnam to Neponset, Mass.; for C. B. K. to Ausable Chasm, N. Y.; for Ausable Nails to New York; Strap and T and Butt Hinges to Pittsburgh, Pa., or Troy, N. Y.; Wood Screws to New York or Providence, R. I.; Carriage Bolts to Detroit, Buffalo, Pittsburgh, Cleveland or Philadelphia; Files to Newark, N. J., New York or Philadelphia; Barb and Plain Wire to Joliet, Ill., Cleveland, Ohio, Johnstown, Pa., or Worcester, Mass., and so on.

How manifestly evident it is that the interest of the retail dealer is to send his order where it can and will be shipped promptly from one house, especially as the price he would pay would, in the aggregate, be less to him than if he sent orders to the various factories where these goods are made. The jobbers feel that the solution of the problem of the manufacturer of how best to get his goods on the market is through the jobbing houses of the country. They are as much of a necessity as the retailer, and as they (the manufacturers) "cannot have their cake and eat it too," or cannot sell both the jobber and his customer, the retailer, they must elect which they will take, as both they may not have. The jobbers do not lie awake nights worrying over this problem. They are getting a large proportion of the trade naturally tributary to them, and they are satisfying their customers as a rule that their best is as good as any one's best. I have watched for many years the growth of the Hardware jobbers of the Northwest, and they are keeping pace with the growth and development of this Western continent, and when they do this they are accomplishing a great deal. You have only to look at the men to conclude that they are abundantly satisfied with the relations existing between themselves and the trade, the retailers, through whom all these goods ultimately reach the consumer. They feel also that the manufacturers will consult their own best interests by putting their manufactures of Hardware through a diversified trade over a broad expanse and rapidly filling up territory through the jobbers of the Northwest;

and they may rest assured that these jobbers are now in a position to put a greater amount of their manufactures into more channels for consumption and at less cost than they (the manufacturers) can by any present known method.

Referring to the condition of things in Sporting Goods, Fishing Tackle, &c., we have the following from a prominent Western house:

The race of jobbers, as we understand the term, is, in our line of trade, at least, practically extinct. We have only larger and smaller dealers, any of whom are willing to retail goods—the larger ones generally at the same prices at which the smaller can buy. This state of affairs is brought about largely by the action of the manufacturers, who, while willing and even anxious to sell both classes, often make, naturally enough perhaps, to the larger buyer concessions which they deny to the smaller. Then in the fierce struggle to sell which ensues, the larger buyer is tempted to, and generally does, give away the advantage he has obtained, and the smaller one is in the soup.

Items.

The Biddle Hardware Company, 507 to 513 Commerce street, Philadelphia, Pa., have taken the store formerly occupied by the Heaton & Denckla Hardware Company, together with the balance of their stock, and this, with their former buildings, gives them a very large and complete establishment. They announce the following in regard to the goods of the Heaton & Denckla Hardware Company:

We offer the old stock of the Heaton & Denckla Hardware Company subject to prior sale on the following low terms: Upon request we will mail a catalogue giving a memorandum of the original stock. These goods are offered at 5 per cent discount for cash in ten days beyond any price at which you have been buying the same goods. To obtain these terms, the price at which you expect the goods must be named on the order, and it is distinctly understood that all orders are subject to prior sale. All goods sold on these terms will be billed on separate invoices and marked on invoice "from Heaton & Denckla Hardware Company's stock." Our job stock will be arranged in our store, 507 Commerce street, conveniently for your inspection, and we feel confident that we can make it pay you to give us a visit and to make your own selections. If the old stock should not contain all the goods wanted, we will either fill the balance out of our own regular stock at bottom prices or write you, giving the lowest price at which we can complete the order. In ordering please state which course you wish us to adopt.

Western File Company, Beaver Falls, Pa., refer to the favor with which their new Horse Rasp, Western 1888, is received and the large business they are doing in it. This Rasp is described as made from a peculiar quality of steel, manufactured especially for that purpose, there being also a special way of annealing and hardening it.

The trade will observe on page 61 the advertisement of the Gibbs Lawn Rake Company, Canton, Ohio, for whom John H. Graham & Co., 113 Chambers street, New York, are agents. It gives illustrations of the Canton Lawn Rake, showing its construction in some detail, and also of the Gibbs Single Blade Post-Hole Digger.

The Beck & Gregg Hardware Company, Atlanta, Ga., issue a variety of circulars relating to the line of goods they handle. One of these calls attention to their Hardware and their supply departments, enumerating a variety of articles under these two heads. They also issue a circular letter, in which they solicit trade and assure their customers of prompt shipments, with satisfactory prices.

The Ames Sword Company, Chicopee, Mass., are issuing an illustrated catalogue of their Patent Perfection Padlocks. The front cover shows the interior mechanism

of these goods, the remainder of the pamphlet being occupied in the illustration of the different articles that they put on the market. Among these are small Padlocks for dogs and cats, Perfection Key Holders, Key Guard Chain, Perfection Padlocks and Padlock Keys, Baggage Protectors, Bicycle Padlocks and Cast Bronze Padlocks. The list of prices on the different goods are given.

E. S. & F. Bateman, Spring Mills, N. J., have issued their 1889 illustrated and descriptive catalogue of their well-known "Iron Age" Farm and Garden Implements. It represents their line of these goods, some of which have been put on the market comparatively recently. It is intimated that during the coming season the old original Iron Age Cultivator and Horse Hoe, which has been extensively imitated, will be still further improved and strengthened.

The Bucher & Gibbs Plow Company, Canton, Ohio, issue an 80-page catalogue, describing their extensive line of Plows, the different patterns of which are illustrated. They allude in their opening circular to the demand for these Plows, which has compelled them to build an addition to their works 46 x 167 feet, three stories high, giving them a much larger capacity. They also issue a separate price list, in which list prices are given without illustrations.

Andrew B. Hendryx & Co., New Haven, Conn., favor us with a beautifully bound copy of their catalogue of Brass, Bronze, Iron and Steel Chain, Wire Picture Cord, a very complete line of Bird Cages and related specialties. Attention is called to some of the special features of these Cages, in which recent improvements have been adopted and a number of new patterns added. The manner which their Wire Picture Cord is put up in boxes is also illustrated. They also issue a catalogue of Hendryx's Fishing Reels, showing a number of patterns, on which prices are given. They state in their circular relating to these goods that they have introduced new methods of manufacture, ignoring the hand-made theory, and making their Reels with improved automatic machinery, permitting them to have interchangeable parts in their Reels. They also refer to the excellence of the workmanship.

The trade will observe the effective illustration on page 51, in which the Shepard Hardware Company, Buffalo, N. Y., bring their Lightning Freezer before our readers. It will be observed that the construction of their wheel dasher is shown, and some of the points in regard to the Freezer, on which they lay emphasis, are mentioned.

The Anderson Bolt Works, of Anderson, Ind., manufacturers of common Carriage Bolts, Lag Screws and Machine Bolts of all kinds, have appointed F. F. Gilmore & Co., of Louisville, Ky., their sales agents for the States of Kentucky, Tennessee, Mississippi, Alabama, Georgia and Southern Indiana and Illinois.

J. P. Caruthers & Co., heavy hardware merchants, 136 Kinzie street, Chicago, have issued a very unique calendar, worthy of a place among grotesque publications. It consists of a large card bearing a colored lithograph of a "gentleman of color," whose feet, extended in front of him, are so large that the soles of his shoes utterly dwarf his body. On the soles are printed the names of the principal articles handled by the firm. A pad with monthly leaves is attached to the bottom of the card.

The annual meeting of the stockholders of the Trans-Continental Car, Lock and Seal Company, of Chicago, was held at the offices of the company, 430 to 434

"The Rookery," on the 16th inst. The following gentlemen were elected as directors for the ensuing year: Warren G. Purdy, John Johnston, Jr., Hobart Chatfield Taylor, J. Edwards Fay, Wm. F. Donovan, Chas. E. Davis, and Jno. W. Norris. The president's report showed satisfactory progress in the past, and very flattering prospects for the future. The new board of directors convened immediately after the stockholders adjourned and elected the following officers to serve for the ensuing year: Jno. W. Norris, president and treasurer; Warren G. Purdy, vice-president; J. Edwards Fay, secretary; Chas. E. Davis, superintendent.

A. L. Day, Eastern manager for the Hoyt Metal Company, St. Louis, Mo., whose office is located at 20 Cliff street, New York, was in St. Louis last week, and reports the outlook very flattering for a heavy spring trade in the territory visited by him.

The St. Louis Metal Company, St. Louis, Mo., whose advertisement appears on page 42, report a heavy trade in their Babbitt Metal and Solder, and find a large and increasing demand for their Anti-Friction Metal. They inform us their sales, especially in this latter metal, are constantly increasing.

A. D. Hall & Son, Charleston District, Boston, Mass., have issued their pamphlet for the present year, in which they illustrate their line of Refrigerators, Ice Chests, &c. It is their eighteenth issue, the business having been established in 1872, and in the opening circular it is stated that they have added several new styles and sizes to meet the demands of their increasing trade. They refer also to the extent of their factory and its complete equipment, and also to the care which is taken in the manufacture of their Refrigerators, and the thorough inspection given to them before they leave the factory. The special features in the construction of their Refrigerators are referred to, emphasis being laid on their Galvanized and Corrugated Wrought-Iron Rack, which is referred to as not rusting nor breaking away, saving the zinc lining, and doing away with wooden racks. From the description given of the Refrigerators it appears that inside the outside case there is a cold dry-air space, the inside case having a felt packing, and being lined inside with zinc. The body of the pamphlet is occupied with a description of their Chests and Refrigerators, which are made in a large variety of sizes with different finish, and adapted for various uses.

We are indebted to Randolph & Clowes, of Waterbury, Conn., for one of their recently issued circulars, illustrating and describing Brown's patent seamless copper house boilers, which they manufacture. On the front of the circular are shown cuts, one representing an exterior view of the boiler, another sectional view, showing the interior and the method of reinforcing it, and the third shows an enlarged section of the joint. An attractive characteristic of the pamphlet is the bronze colors in which the cuts of the boiler are printed. Another feature is a representation of a narrow blue ribbon, with red seal attached, giving the appearance of sheets tied together. Within the circular the boiler is very fully described, and all its principal advantages are pointed out.

The inconvenience endured by merchants on account of the diversity in forms and sizes of their price lists and trade literature generally has frequently been referred to by Hardwaremen in this country, and the same matter has been repeatedly alluded to by English Hardware merchants, with whom, however, owing to the fact that there are much fewer catalogues, circulars, price lists, &c., published there than here, there is less annoy-

ance from this source. The following letter on the same subject comes, however, from New Zealand, which, notwithstanding its distance, seems to be afflicted in the same way:

The present system of producing catalogues of any size to please the eye of the producer is really most prejudicial to his best interests. Much money is often spent in the production of these works, but as many of us have no more room than we know what to do with, we cannot make the use of the catalogues we should like. What we require is a book of decent size, which we can place on our shelves for easy reference at any time. Now, the lists, being of all sorts of shapes and sizes, are simply piled up one on top of the other until they become an almost useless heap.

The catalogue of Studebaker Bros. Mfg. Company, South Bend, Ind., in which they illustrate their Skein and Veneer departments, is an elegantly printed pamphlet. In it their Wrought Steel Skein is given with the revised price list adopted on the 3d inst. Their Cast Thimble Skein is also shown. The latter part of the pamphlet is devoted to an explanation of the construction of their Veneer Seat and the illustration of different Seats, Veneers and Dashes, with something of a description of their works.

The trade will observe the announcement on page 88 by the Van Wagoner & Williams Company, 82 Beekman street, New York, in regard to their Hero and Monarch Spring Hinges, and their right to manufacture the same.

The advertisement occupying page 80, in which the A. F. Pike Mfg. Company, Pike's Station, N. H., call attention to their manufactures, will be observed by our readers, and especially its intimation that low prices may be obtained.

The Russia Cement Company, Gloucester, Mass., make the announcement that their New York City trade, who formerly obtained Le Page's Glues from Tower & Lyon, can now be supplied by Underhill, Clinch & Co., 94 Chambers street, where a full stock of the goods is carried.

Wm. Highton & Sons, 55-63 Charleston street, Boston, Mass., issue a circular relating to their line of Registers, some of which of new design are illustrated. Their object in issuing the circular is to bring the dealer and manufacturer in direct communication. For a number of years their business has been done largely through an agent, but they state that the time has come when they consider that they can sell their goods direct to the dealer to better advantage. Attention is called to the important points of their Registers, such as the vertical wheel and lock nut, adjustable end piece, new ventilator attachments and open or shut indicators, &c., which are their own inventions. A large stock of different sizes of Registers, Faces and Borders in the several finishes is carried.

C. F. Guyon & Co., 99 Reade street, New York, have been appointed sole agents for M. Einwachter, Newark, N. J., and will carry on hand a full line of Tools of his manufacture. This line embraces the following among other goods: Screw-Drivers, Countersinks, Reamers, Punches, Rivet Sets, Scratch Awls, Can Openers, Tack Claws, &c.

Lindsay, Parvin & Co., of Philadelphia, have added to their general Iron business, a new department, which includes Barb Fencing, Plain and Galvanized Wire, Wire Cloth, Nettings, &c. They are also doing a large business in Crimped and Corrugated Roofing, the demand for which they say is steadily increasing.

The works of the Perkins Lock Mfg. Company, Cleveland, Ohio, were nearly destroyed by fire Sunday, January 13. But the company have arranged for new quarters, and, as their castings are made

outside of their old place of business, they expect to be able to fill orders in full within 80 days. They have appointed J. C. McCarty & Co., 97 Chambers street, New York, as their agents, who will carry a full line of the goods in stock, and who are in a position to give the company's list prices.

Underhill, Clinch & Co., 94 Chambers street, have been appointed agents for the sale of Porter's Patent Window and Door Screen Corners, Sticks for Frames, &c., and the Queen City Adjustable Window Screen, manufactured by the Porter Mfg. Company, Burlington, Vt.

The copartnership heretofore existing between John H. Logan and Turner Strobridge, under the firm name of Logan & Strobridge, New Brighton, Pa., was dissolved January 9, and a new partnership formed under the name of Logan & Strobridge Iron Company, which is composed

also issue a pamphlet devoted to Reflector Chandeliers for gas, electric light or oil. A number of attractive styles are illustrated, with list prices. The quality of these goods and the satisfaction which they have given throughout the United States and Canada are referred to.

Arrangement of Stores.

The accompanying illustration, Fig. 306, represents a Bird Cage rack in connection with an arrangement for the display of Japanned Goods. For a description of this arrangement we are indebted to Geo. O. Hart & Son, Paducah, Ky. The Bird Cage rack is made of $1\frac{1}{2}$ inch gas-pipe, bent in the form of an arch, as shown, the extreme height from the top to the floor being 16 feet. Holes $\frac{1}{4}$ inch in diameter are punched 14 inches apart, threads cut in the holes, and hooks 12 inches long are screwed in on both sides. There are two pieces of iron, $4 \times 8 \times \frac{1}{4}$ inch,

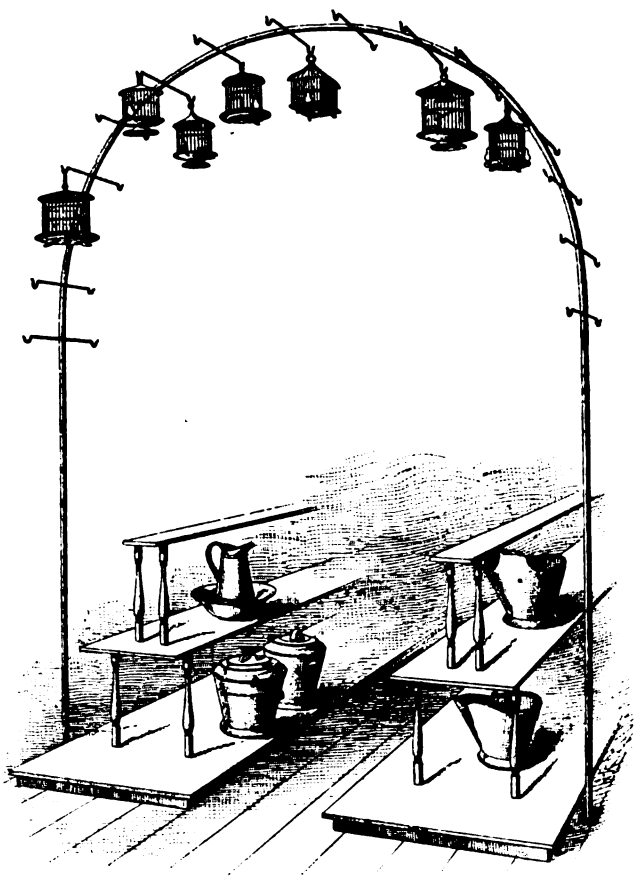


Fig. 306.—Bird Cage Arch.

of John H. Logan, Turner Strobridge, Charles C. Robinson and L. R. Strobridge. The officers are as follows: J. H. Logan, president; T. Strobridge, vice-president; C. C. Robinson, secretary and treasurer; L. R. Strobridge, superintendent. The new company announce that, having purchased the business of the late firm, it is their intention to push forward with even greater energy than their predecessors, continuing the manufacture of the full line of goods manufactured by them—Coffee Mills, Farm and Plantation Mills, Building and House-Furnishing Hardware, &c.—while they will also make a specialty of Iron and Brass Castings of all classes.

The Wheeler Reflector Company, 24 Washington street, Boston, Mass., issue a pamphlet describing their system of Reflectors, with a number of testimonials. The different styles of Reflectors are represented, including Street Light Reflectors, Railroad, Porch and Stable Lanterns, Wall Bracket Lamps, Library and Argand Reflectors, and others. A very complete line is thus offered to the trade. They

forming the junction between the floor and the arch. These plates are screwed on the pipe, making feet, and are then lag-screwed firmly to the floor. The whole is painted green, and the tips of the hooks and the couplings are bronzed, making an attractive finish. When this rack is filled with Cages it is described as producing a beautiful and striking effect. The economy of space is one of the points made in connection with it, the floor space being limited only to that occupied by the plates. Beneath the arch are two Japanned Goods stands, which are made of 1 inch poplar boards. At the bottom they are 4 feet 4 inches wide; the second shelf is 2 feet 6 inches wide, and the top or third shelf is 10 inches wide. The legs or uprights are nicely turned and the whole is stained walnut. One of these stands is used for Toilet Sets and the other for Coal Vases. The bright colors of these goods are described as making a very attractive and pretty view from the street. The inexpensiveness of the stands is alluded to, and we are advised that they can be put up for from \$3.50 to \$5, according to the finish and size.

Business Methods.

From the McFadden Company, successors to Tallman & McFadden, Philadelphia, Pa., we have received information in regard to some of the forms which they use in connection with their business, which, embodying as they do some novel features, will doubtless be of interest to many of our readers. One of these to facilitate the sending of inquiries by their customers in regard to prices we reproduce below, reducing its width slightly and omitting the blank space:

McFADDEN COMPANY,

No. 1025 Market Street, Philadelphia.

Please give lowest price at which you will sell the following list of Tools:

HOW MANY.	DESCRIPTION OF TOOLS. <i>Give here name of tool, size, and number, if any given in Catalogue.</i>	PAGE OF CATALOGUE.
.....
.....
.....

At the foot of the sheet headed as above are the following directions to their customers:

Write your name and address in full on the other side of this sheet. Give the name of the express company by whom we can ship, and we will, if possible, quote prices delivered.

And on the back of the sheet is the following blank for the name, address, &c., of their customers:

Name.....
Business of trade.....
P. O.....
County..... State.....

The McFadden Company have also an order blank which has been found exceedingly convenient, and which, in reduced size, is reproduced below. This form is referred to as particularly useful in ordering special goods, and dealers who are called upon to furnish special Screws, Caps, Drills, &c., will see the convenience of the system. The form of the blank given herewith consists, it will be seen, of the order which is sent to the party from whom the goods are purchased, and the stub which is kept on file by the order clerk. The original order is in copying ink, and the copy made therefrom is put in the hands of the stock clerk in order to avoid having invoices go out of the office, a practice which is objectionable for different reasons. The stock clerk is more readily informed as to the disposition which is to be made of the goods by reference to this duplicate than by any other means the company have been able to devise. It is used by him in checking goods when received, and affords him information as to the disposal of the same.

Obituary.

At a meeting of the Table Cutlery Manufacturers, held January 18, the following was adopted:

This association having learned of the death of Mr. A. B. Wetherell, desire to give expression to their feelings of respect to his memory. Mr. Wetherell was the warm personal friend of every member of this body, and we one and all bear tribute to his unselfish friendship and his sterling worth as an honest man. The secretary is directed to spread this vote on the records, and send a copy to his family, and publish it in *The Iron Age*.

"Wholesale and Retail" in the United States.

Under this heading the last issue of the *London Ironmonger* has the following editorial remarks in regard to the discussion which has been carried on in these columns concerning the question as to whether there is an increased tendency toward direct dealings between the manufacturers and the retailers:

An interesting and well-sustained discussion has been in progress for some

size of the United States, and consequent long distances and heavy railway rates, renders any exact comparison between the course of American and of English trade somewhat inexact, yet it cannot fail to be interesting to note the tendencies of the trade in the States. The correspondents of *The Iron Age* have written from various parts of the Union, and the general drift of their letters seems to demonstrate that there is an increasing tendency in the direction of retailers buying direct from the manufacturers. This tendency is so marked in certain lines of goods that it may be said to have become a practice, and that almost all heavy or bulky goods are now generally bought direct from the makers. Such goods as Stoves, Agricultural Implements, Barbed Wire and Nails are included in this category. In the smaller lines of Hardware, "notions" and the like, the large jobbers appear to hold their own, and even do an increasing business in many sections of the country. One firm—Straub & Co., Evansville, Ind.—send a carefully tabulated statement showing the percentages of their purchases from manufacturers and jobbers over a long series of years, and as this table appears to be indorsed by many other firms who have sent their views, we reproduce it here.

[Here follows the table furnished by F. P. Straub & Co., which was published in our issue of October 11, 1888, showing the percentage of bills purchased by them during the years from 1858 to 1888 from manufacturers and jobbers, Eastern and Western.]

According to these figures the tendency toward direct trading with the manufacturers appears to be very marked indeed, although for some reason or other not clearly explained more has been done with the jobbers this year than for some years before. Some of the retailers explain that they are going to the

Order No. 7008.

Date, January 8, 1889.

To L. S. Starrett.

Acknowledgment Received Jan. 9, '89.

Goods Promised January 10.

Invoice Received January 11.

Goods Received January 11.

Goods for

A Stock.
B 1-12 doz. J. Smith bal. stock.
C Jos. Jones, 1112 Chestnut street.
D C. O. D.

E
F
G
H
I
K
L
M
N
O
P

Requisition by Painter.

Goods Checked by Cretin.

McFADDEN COMPANY,

Successors to TALLMAN & McFADDEN,

Dealers in TOOLS, HARDWARE AND SUPPLIES,
No. 1025 Market Street.

Order No. 7008. PHILADELPHIA, January 8, 1889.

Mr. L. S. Starrett,

Athol, Mass.

Please ship via Express.

Consigned to Us.

Item. Quantity.

A 1 doz. Calipers, No. 88.
B 1-3 doz. Micrometer Caliper Squares.
C 1-12 doz. Special Rules to accompanying sketch.

D
E
F
G
H
I
K
L
M
N
O
P

This, the original order, is written with copying ink and copied in a regular letter-press book.

Above to be delivered on cars without charge for boxing or cartage.

Kindly write us upon receipt of this order, stating when you will probably ship the same to us.

Mention number of order in all communications.

Yours truly,

most important of them are located in New York, so far as the Eastern States are concerned and in Chicago as regards the Central and Western States. With the great and continuous growth of the Northwest and West, the tendency of the centers of distribution to move further West also becomes increasingly pronounced; hence the jobbers of St. Louis, St. Paul, Kansas City and other like places are becoming more serious competitors for the trade of their several districts. The great

manufacturers because they "know what they are getting," because they can get better goods, and because the jobber "cares nothing for any name or brand except his own, only taking care to buy in the cheapest market, and, instead of sending the goods ordered, often puts retailers off with articles which the jobbers say are 'just as good or better.'" Many of the correspondents of our contemporary also complain that the jobbers do not pack so well as the manufacturers, and also that

some of them sell direct to large consumers. The majority of the letter-writers admit, however, that the jobber is often a great convenience, particularly because he can supply goods more promptly than the manufacturers, which is quite natural when the great distance of the West from the Eastern manufacturing centers is borne in mind. On their part, many of the manufacturers are opening out their own agencies in Chicago and other Western cities, consequently it is evident that those who adopt that plan are desirous of promoting trade direct with the retailers and over the heads of the jobbers. It is in evidence, indeed, that the manufacturers are active and energetic in "picking over" the retail trade, selecting the best payers as their own customers, and leaving the others to deal with the jobbers. The plan certainly has the merit of sagacity and enterprise.

Louisville.

From Louisville, Ky., we have the following report under date of January 19:

The Hardware trade of Louisville, Ky., has been remarkably good for the past two weeks. Low prices generally rule, but the consumption continues large, showing that the extremely mild winter permits outdoor improvements to go steadily on, and a trip in any direction along the railroads proves that the country is keeping pace with the cities and towns. The constant demand for builders' supplies has not ceased at all this winter, and some predict that there will be no spring trade in such goods, but a past prosperous year for the farmers promises continued demand on the merchants. The Nail trade from the jobbers is good, making constant calls on the mills, which seems to justify an advance from present prices at next meeting of the mills. The Wire Nail business is also large, with low prices ruling, but the trade expects some extreme cuts to be withdrawn soon. Dealers in Wagon and Carriage Hardware report the state of order books extremely satisfactory, and that they are as busy as they care to be.

Exports.

PER SHIP SEA WITCH, JANUARY 5, 1889.
FOR SIDNEY, N. S. W.

By *McLean Bros. & Rigg*.—21 Fire Arms, 5 Wind Mills, 44 Guns, 77 sets Loading Tools, 255,000 Primers, 34,000 Metallic Cartridges, 5 dozen Locks, 1 dozen Lemon Squeezers, 408 dozen Handles, 29 Air Guns, 4 dozen Lemon Squeezers, 3 cases Plated-Ware, 133 Drills, 11,600 Bolts, 10 dozen Axes, 90 dozen Axes, 35 packages Carriage-Ware, 45 dozen Saws, 121 Plows, 5 dozen Washboards, 6 dozen Hammers, 9 dozen Saws, 18 dozen Locks, 196 dozen Handles.

By *V. Basanta*.—207 dozen Hardware, 300,000 Primers, 24 dozen Hammers, 18 dozen Rakes, 9 dozen Oil Cans, 3 dozen Corn Mills, 2½ dozen Clothes Wringers, 2 1-6 dozen Rifles, 25 cases School Slates, 120 gross Crayons, ½ dozen Air Guns, 2 dozen Velocipedes, 3½ dozen Velocipedes, ½ dozen Perambulators, 2000 Broom Handles, 12 1-12 dozen Lamp Goods, 13 sets Harness, 1 gross Thermometers, 50 gross Lamp Wicks, 1 dozen Clocks, 8 gross Traps, 15 dozen Braces, 27 dozen Cow Bells, 16 dozen Lamp Goods.

By *Arkell & Douglas*.—32,020 pieces Roofing Slate, 9 cases Wringers, 8 dozen Corn Mills, 60 dozen Axes, 2 dozen Corn Mills, 14 dozen Saws, 20 dozen Hatchets, ¼ dozen Scales, 1 dozen Lawn Sprinklers, 20 dozen Hammers, 3 cases Whetstones, 6 cases Mattocks, 40 dozen Axes, 28 dozen Forks, 10 gross Axes, 40 dozen Handles, 96 dozen Corn Mills, 17 dozen Bird Cages, 16 dozen Glass Ware, 12 cases Carriage Ware, 4 cases Castings, 300 pounds Hardware, 200 pounds Hardware, 10 crates Wheels, 96 dozen Bolts, 9 cases Carriage-Ware, 7 dozen Whiffletrees, 13½ dozen Forks, 1 case Nails, 7 cases Castings, 15 dozen Latches, 6 dozen Rakes, 6 dozen Picks, 11 dozen Axes, 21 dozen Hammers, 1½ dozen Guns, 24 boxes Clothes Pins, 13 dozen Hoes, 8 dozen Axes, 2 packages Pumps, 30 gross Wicks, 3 cases Saws, 20 dozen Spades, 6 packages Lamp Ware, 20 dozen Glass Ware, 10 Shellers, 10 dozen Spades, 5 gross Axle Grease, 12 dozen Saws.

By *W. H. Crossman & Bro.*—½ dozen Wringers, 3 dozen Clocks, 9 dozen Wrenches, 3 sets Tools, 24 pairs Roller Skates, 72 dozen Handles, 20 dozen Hatchets, 1 case Hardware, 7 dozen Brooms, 1 case Hardware, 28 packages Carriage-Ware, 20 dozen Axes, 4 Drills, 1 case Hardware, 11 cases Tools, 19 cases Hardware, 1 dozen Paint Mills, 4 dozen Vises, 32 dozen Axes, 3 dozen Store Trucks, 10 dozen Traps, 100 gross Wicks, 24 dozen Hair Brushes, 2 dozen Shot Cases, 48 dozen

Handles, 6 dozen Shot Cases, 24 dozen Guns, 12 sets tools, 50,000 Primers, 10,000 Cartridges, 50 Clocks, 6 dozen Lanterns, 110 pairs Roller Skates, 600 pounds Bolts, 1 case Hardware, 27 dozen Hatchets, ¾ dozen Wringers, 5 cases Tools, 1 case Hardware, 120 dozen Handles, 10 dozen Axes, 12 dozen Handles, 3 cases Hardware, 20 Guns, 18,000 Cartridges, 140,000 Primers, 50 sets Tools, 100 dozen Oars, 4 dozen Mattocks, 1 Saw, 2 packages Pumps, 1 case Carpenters' Tools, 18 Churns, 8 dozen Rakes, 4 cases Hardware, 24 dozen Traps, 33 gross Wicks, 1 case Lamp Goods, 3 dozen Braces, 1 case Tools, 10 dozen Axes, 1½ gross Wood Spoons, 1 case Plow Parts, 23 packages Tools, 23 Vises, 5 packages Hardware, 1 dozen Wringers, 1 case Hardware, 12 dozen Axes, 9 cases Hardware, 2 packages Wringers, 1200 Cartridges, 1 dozen Revolvers, 14 cases Hardware, 94 dozen Traps, 27 dozen Wrenches, 18 dozen Braces, 8 dozen Braces, 1 case Traps, 8 Cages, 10 dozen Wrenches, 4 dozen Scales, 8 dozen Saws, 10,000 Cartridges, 12 Rifles, 12 sets Tools, 12 Guns, 24 sets Tools, 30,000 Cartridges, 24 dozen Axes, 20 dozen Braces.

By *R. W. Cameron & Co.*—840 pounds Glue, 7 packages Bolts, 360 dozen Handles, 19 barrels Iron Pipe, 2 cases Parts, 2 Stationary Engines, 2 cases parts Stationary Engines, 3 Blowers, 6 cases Machinery, 337 packages Iron Wheelbarrows, 43 crates Pulleys, 1 case Hardware, 654 dozen Chimneys, 15 gross Wicks, 5 cases Lampware, 30 dozen Axes, 30 gross Blacking, 225 cases Slates, 3 boxes Machinery, 1 case Hardware, 1039 packages Hardware, 3 boxes Belting, 88 Locomotive Tires, 1200 pounds Nuts and Bolts, 25,000 pieces Slate, 1 case Planes, 10 cases Cartridges, 2 cases Hardware, 2 cases Skate Wheels.

By *Coombs, Crosby & Eddy*.—2 gross Blacking, 20 dozen Axes, 10 dozen Axes, 18 dozen Agricultural Tools, 1 gross Lemon Squeezers, 100 boxes Clothes Pins, 1000 Broom Handles, 10 Stoves, 42 dozen Slates, 100 gross Crayons, 280 pounds Stones, 54 dozen Wringers, 10 dozen sets Irons, 10 dozen Balances, 10 gross Hardware, 12 dozen C. L. Reels, 12 dozen Hardware, 140 pounds Oil Stone, 12 dozen Braces, 41 dozen Tools, 1 gross Hardware, 2 dozen Axes, 10 dozen Picks, 12 dozen Washboards, 8 dozen Tools, 9 dozen Hardware, 350 pounds Hardware, 2 gross Lemon Squeezers.

By *Isley, Doubleday & Co.*—3 dozen Paint Brushes, 12½ gross Axle Grease, 20 dozen Horse Brushes, 18 dozen Horse Brushes, 21 dozen Paint Brushes, 6½ gross Axle Grease, 10 cases Hardware, 4 cases Castings, 4 bundles Hardware, 12 cases Bolts.

By *H. W. Peabody & Co.*—37 packages Stoves, 7 packages Hardware, 8 cases Wringers, 71 cases Lampware, 1500 feet Hose, 4 packages Pumps, 4 cases Lampware, 6 cases Sewing Machines.

By *R. W. Forbes & Son*.—1 package Hardware, 1 dozen Adzes, 2 boxes Hardware, 17 packages Corn Mills, 6 packages Corn Mills, 97 boxes Sewing Machines, 48 dozen Handles.

By *F. Hodiome*.—2 cases Wheels, 1 case Bolts, 8 cases Brooms.

By *Rand Drill Company*.—3 boxes Wire Fuses, 2 boxes Batteries, 1 box Wire.

By *F. B. Wheeler & Co.*—160 cases School Slates.

By *Collins Company*.—91 dozen Edge Tools, 170 dozen Picks, 165 dozen Handled Axes.

By *J. L. Mott Iron Works*.—18,980 pounds Stoves and Parts.

By *W. E. Peck & Co.*—3 cases Powder and Cartridges.

By *Healy & Earl*.—12 cases Wood Working Machinery, 8 boxes Pumps, 11 packages Wind Mills, 6 cases Forges, 1 box Drills, 1 box Emery Wheels, 1 case Saws.

By *Leaycraft & Co.*—30,580 pieces Roofing Slate.

By *Edward Miller & Co.*—73 packages Lamp Goods, 14 packages Lamp Goods, 6 packages Lamp Goods.

By *A. Field & Co.*—12 Stoves, 1 Rifle.

By *Ansonia Clock Company*.—24 boxes Clocks.

By *W. K. Freeman*.—11 cases Agricultural Machinery, 12,305 pounds Axles, 62 cases Edge Tools, 465 pounds bicycles.

By *A. S. Lascelles & Co.*—20 dozen Axes, 38 dozen Axes, 1 gross Oil Stoves, 4 dozen Wrenches.

By *E. W. Harrison*.—1 case Wood Handles, 5 cases Picks, 3 cases Drills, 6 cases Hardware, 14 packages Pumps, 8 packages Pumps.

By *Ansonia Clock Company*.—60 packages Lamp Goods, 16 boxes Clocks.

By *S. H. Payne & Son*.—1000 pairs Roller Skates.

By *Fairbanks & Co.*—1901 pounds Scales, 488 pounds Money Drawers and Parts of Scales.

By *Strong & Troubridge*.—6 cases Tools, 2 cases Saws, &c.; 9 cases Fire Arms and Cartridges, 7 cases Hardware, 3 crates Sad Irons, 3 cases Sad Irons, 1 case Vises, 6 cases Oil Stones, 1 case Nails, 7 cases Handles, 1

case Handles, 3 cases Choppers, 2 cases Clocks, 4 cases Wringers, 4 cases Saws, 1 case Chisel Handles, 10 cases Axle Grease, 17 cases Axe Handles.

By *J. A. Gifford*.—3 cases Perambulators.
By *Morris, Strouse & Co.*—200 boxes Clothes Pins.

By *Barber & Co.*—2895 pounds Iron Castings.

By *Ansonia Clock Company*.—39 boxes Clocks, 36 boxes Clocks, 26 boxes Clocks.

By *H. F. Roberts*.—640 pounds Plated Ware.

By *M. R. Gildersleeve*.—71 packages Lamps and Parts.

By *P. D. Ackerman & Co.*—12 barrels Silver-Plated Ware.

By *Peters & Calhoun Company*.—3 cases Saddlery.

By *Russell & Erwin Mfg. Company*.—8 packages Hardware.

By *Winchester Repeating Arms Company*.—30,000 Cartridges, 60,000 Primers, 2000 Bullets, 20 sets Tools.

By *T. Levering & Co.*—225 cases School Slates.
By *Holmes, Booth & Haydens*.—5 boxes Electric Wires.

By *Welsh & Lea*.—6 cases Iron Bolts.

By *E. N. Welch Mfg. Company*.—36 boxes Clocks.

By *P. D. Ackerman & Co.*—6 cases Plated-Ware.

By *E. K. Al Burtis*.—18 Guns, 15,000 Cartridges, 2 packages Hardware, 45 sets Axes.

By *Meriden Britannia Company*.—12 boxes Coffin Furniture.

PER BARK ELINOR VEMOR, JANUARY 10, 1889,
FOR WELLINGTON, NEW ZEALAND.

By *D. C. Pratt*.—468 dozen Slates.

By *White Sewing Machine Company*.—2369 pounds Sewing Machines and Parts.

By *Ansonia Clock Company*.—14 boxes Clocks.

By *Coombs, Crosby & Eddy*.—6 dozen Axes.

By *Arkell & Douglas*.—85 dozen Handles, 5 boxes Plated-Ware, 26 cases Edge Tools, 6 nests Pails, 1 dozen Ladders, 646 pounds Hardware, 6 5-12 dozen Saws.

By *H. W. Peabody & Co.*—90 cases Edge Tools, 1 bundle Agricultural Implements, 24 dozen Rollers, 8 cases Hardware, 5 cases Hardware.

By *W. H. Crossman & Bro.*—16 dozen Axes, 1 cask Lamp Goods, 240 dozen Handles, 8 dozen Traps, 5 dozen Saws, 240 pounds Tacks, 3½ dozen Wringers, 2 cases Hardware, 8 cases Hardware, 2 packages Pipe Fittings, 1 case Carpenters' Tools.

By *A. S. Lascelles & Co.*—4 packages Lampware.

By *R. W. Forbes & Son*.—18 pairs Axles, 3 packages Hardware, 12 dozen Spade Handles, 1 dozen Wringers, ¼ dozen Mangles, 10 dozen Axes, 50 cases School Slates, 9 Stoves, 8 dozen Spade Handles, 3 packages Hardware, 67 cases School Slates, 17 packages Hardware, 1 case Wringer Rollers, 7 cases wringers, 7 racks Churns, 1000 Hoe Handles, 12 dozen Hoe Handles, 2 packages Hardware, 10 gross Shade Rollers, 1220 pounds Bolts, 1 package Taps and Dies.

FOR AUCKLAND AND WELLINGTON.

By *R. W. Cameron & Co.*—25 dozen Axes, 48 dozen Axes.

By *Mailler & Quereau*.—240 dozen Handles, 160 dozen Brooms, 10 dozen Picks, 200 boxes Clothes Pins, 70 Packages Washboards, 25 packages Sewing Machines, 10 cases Pigeon Traps.

The Buffalo Scale Company, Buffalo, N. Y., who have been in the market for more than a quarter of a century, have recently been furnishing scale outfits for various cotton oil mills throughout the Southern States, and at the same time have been supplying scales to many industries, to numerous railroads and the United States Government, as well as to different branches of the trade in this and foreign countries. Among recent important sales may be mentioned sales of iron frame railroad track scales to the United States Government, Armour Packing Company, Kansas City, Mo.; Edison Machine Company, Schenectady, N. Y., and a number of oil mills in Texas, Arkansas, Georgia, Louisiana and other Southern States, a large number of railroads in different parts of the country, Russell & Co., Massillon, Ohio; American Pulp and Paper Company, Tiffin, Ohio, and many other concerns. They are also supplying the scales used by the Indian Department, United States Government. In all this the trade will find evidence of the progress and position of the company.

The Production of Steel Rails.

James M. Swank publishes in the *Bulletin* of the American Iron and Steel Association the result of complete returns of the production of Bessemer steel rails in this country in 1888, not including a few thousand tons which were rolled by iron rolling mills from purchased blooms, but including all rails rolled by our Bessemer steel works. We give below in net tons the details of the production by these works in the first half and second half of 1888, compared with the production of the Bessemer steel works of the country in 1887, net tons:

States.	First half of 1888.	Second half of 1888.	Total 1888.	Total 1887.
Pennsylvania..	420,101	491,105	911,206	1,221,280
Illinois.....	256,823	228,888	485,706	728,526
Other States...	98,337	82,808	181,145	240,382
Total.....	775,261	782,796	1,558,057	2,290,197

The total production of steel rails in 1888 by the works above mentioned was 1,528,057 net tons, or 1,364,337 gross tons, against 2,290,197 net tons, or 2,044,819 gross tons in 1887—a decrease in 1888 of 680,482 gross tons, a shrinkage which is greater than our total production of steel rails in 1879, when we made 610,682 gross tons. The decreased production of 1888 as compared with the production of 1887 was almost exactly 33½ per cent. It will be noticed that the production in the last half of 1888 was less than in the first half.

Our consumption of steel rails in 1888 was fully 750,000 gross tons less than in 1887, the imports in 1888 having declined about 77,000 tons as compared with 1887. In 1887 they amounted to 137,588 gross tons, and in 1888 to about 60,000 gross tons.

The Societe des Metaux.

The Société des Métaux, or, to give it the full benefit of its title, the Société Industrielle et Commerciale des Métaux (Anciennes Etablissements J. J. Laveissière et Fils et E. Secretan), started business on quite a family footing. Of the 50,000 500-franc shares, comprising its capital, 2000 only were offered for public subscription, the rest being divided equally between Messrs. J. J. Laveissière et Fils and M. Eugene Secretan (acting as liquidator of the Société Métallurgique de Cuivre), as vendors—the first-named of their works at Deville-lès-Rouen, St. Denis and Petit Poigny, the good-will of their business and patents; the second of the company's works at Lalande, Castelsarrasin, Serfontaine, and Givet, the business in Paris, and the stock-in-trade valued at 2,000,000 francs.

The *Financial News* reports that the company was founded in 1881 for a period of 35 years for the purpose, according to the articles of association, of carrying on the business of the before-mentioned works, and of treating and generally dealing in copper and all other metals. It was well started in life, its original board of directors consisting of Messrs. Emile Laveissière, Arbel, Champouillon, G. Girod (of Messrs. André, Girod & Co., bankers; late director of the Comptoir d'Escompte), A. Hentsch (president of the Comptoir d'Escompte), Herpin (late director of the Société Générale), Labelonge, Jules Joseph Laveissière, Puerari (of Messrs. Mirabeau, Puerari & Co., bankers), Eugene Secretan, Théodore Vernes (of Messrs. Vernes & Co., bankers), and Jean Joseph Laveissière.

It has since been modified as follows: Messrs. Arbel, Champouillon, G. Girod, of André, Girod & Co., bankers (late director of the Comptoir d'Escompte), Hentsch (president of the Comptoir d'Escompte), Denfert Rochereau (director of the Comptoir d'Escompte), Labelonge,

Ed. Joubert (vice-president of the Banque de Paris et des Pays Bas), Emile Laveissière, Puerari (of Mirabeau, Puerari & Co., bankers), Eugene Secretan, Jules Lecuyer (banker).

Besides the share capital of the company, which in April last was increased from 25,000,000 francs to 50,000,000 francs, there are 40,000 fully paid-up debenture bonds of 500 francs, bearing interest at the rate of 5 per cent. per annum, and reimbursable in 35 years. The profits of the company, after deducting 5 per cent. for a reserve fund (which may be reduced or suspended as soon as the said fund attains a sum equal to one-tenth of the capital), have first to provide 6 per cent. interest on the paid-up share capital, the surplus being divided as follows:

12 per cent. for the remuneration of the directors.
13 per cent. to be distributed as the directors see fit for the remuneration of the "Committee of Direction and Management," and 75 per cent. as dividend for shareholders.

Surplus dividends have been distributed as under:

Year.	Francs.	Year.	Francs.
1882.....	47.50	1886.....	30.00
1883.....	30.00	1887.....	60.00
1884.....	Nil.	1888 (interim)...	30.00
1885.....	10.00		

National Convention of Builders.

The well-wishers of the National Association of Builders are doing all in their power to make the Philadelphia convention next month a success. The object of the circular recently issued by Secretary Sayward was to induce a large attendance at the coming meeting, and so far as the influence of argument and a clear statement of the work of the association are concerned, the circular left nothing to be desired. The promoters of the organization, however, have wisely recognized the fact that mere argument is not always sufficient to arouse an active interest in a worthy object, and so they have taken pains to insure a thoroughly hospitable reception to the visiting builders. The delegates are to be quartered at the Continental Hotel and Girard House. The lecture-room of the Franklin Institute, opposite the Exchange's newly purchased property, has been secured as a meeting place, and the programme for a three days' session has been mapped out. National President John S. Stevens is to make the opening address on Tuesday morning, February 12, and then the regular order of business is to be taken up. An interesting and also instructive feature of the convention will be addresses by a number of prominent men, among whom we notice the names of Colonel Auchmuty, Mr. O. P. Hatfield, Mr. Sayward, secretary of the association and others, who will speak on special topics appropriate to the occasion. At the close of the convention the guests will be entertained at a banquet to be given in Horticultural Hall. As a further means of bringing about a large gathering, steps have been taken to have certain other meetings and conventions of allied trades occur at Philadelphia about the same time, so that delegates in many instances will be able to attend more than one meeting and thus save themselves both time and expense.

The examination of the pieces of the Hainsworth gun, which was destroyed at the tests made by the Government some weeks since, has been commenced by the officials of the Pittsburgh Steel Casting Company, at Pittsburgh. Superintendent Hainsworth states that the examination will be thorough and will require at least six weeks. He is confident that the tests will prove that the bursting of the gun to a great extent was due to the fact that he had subjected the breach to two temper-

ings, which resulted in making it too hard. The other part of the gun was only tempered once.

NEW PUBLICATIONS.

KRUPP AND DEBANGE. By E. Monthaya. Translated with an appendix by O. E. Michaelis, Ph.D. Illustrated. Thomas Prosser & Son, New York.

This work seeks to compare the two great European ordnance systems—that of Krupp, of Germany, which has been known and practically tested for years, and that of De Bange, of France, which is of comparatively recent origin. Although the writer is convinced that the Krupp system is superior to the other, he has not permitted this opinion to warp his statements, which are based entirely on facts and authoritative writings. The first chapter describes gun metal and its properties, cast and wrought iron, bronze and various steels. The second deals with gun construction—Krupp and De Bange. Then follow ballistic performance and the Krupp system in European States. The second part deals with the weakness of the objections raised by the adherents of the French gun against the Krupp. This part closes with the French and German systems of gun manufacture and their results. Part third is an admirable description of the Krupp works. The appendix is an analysis of criticisms made upon the book. The work will attract attention, especially at this time, when so much interest is manifested in the subject in this country.

PRINCIPLES OF THERMODYNAMICS, WITH SPECIAL APPLICATIONS TO HOT-AIR, GAS AND STEAM ENGINES. By Robert Röntgen. Translated, revised and enlarged by A. Jay DuBois, Ph.D. Illustrated. John Wiley & Sons, New York. Price, \$5.

To this, the second edition, very considerable additions have been made. The work opens with two celebrated lectures of Professor Verdet, on the mechanical theory of heat. In the first lecture observation and theory are placed side by side; every experiment is shown to be the realization of an idea. In the second lecture an opposite course is pursued, the object being to deduce general laws from the study of special phenomena, particularly in those machines deriving their motive power from the action of heat; the subject proper of this lecture is therefore the heat engine. A proper understanding of the lectures and their copious notes will render easier the comprehension of the technical discussion following. Thermodynamics, immediately following the lectures, contains the mathematical treatment, in an elementary form, of heat. To understand this subject a knowledge of algebra and the simplest mechanical principles is all that is required. A feature of the work is the application of the theory of heat to the important cases arising in practice. In the abstract from Pernolet's work, *L'Air Comprimé*, is presented a table, from which the initial pressure and degree of expansion can be obtained for an engine of a given horsepower consuming a given quantity of air. The work also contains Zenner's theory of superheated steam. There is also a valuable summary of the principles which should govern the construction of a steam engine, with a complete calculation of a proposed engine. The work is intended to serve as a foundation for a more thorough course.

The Tilly Foster mine is now producing at the rate of 100 tons a day. A contract has been made, by which 60,000 tons are to be delivered annually for 90 cents a ton, broken, on cars at mine. This would make the cost of the 50 per cent. Bessemer ore to the Lackawanna Coal and Iron Company, delivered at Scranton, Pa., about \$2.30, or less than 5 cents a unit at furnace.

CURRENT HARDWARE PRICES.

JANUARY 23, 1889.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers' name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers, at the figures named.

Ammunition.

Caps, Percussion, \$1000—	
Hicks & Goldmark's	
F. L. Waterproof, 1-10's.....	50¢
E. B. Trimm'd Edge, 1-10's.....	55¢
E. B. Grnd. Edge, Cent. Fire, 1-10's.....	70¢
Double Waterproof, 1-10's.....	\$1.40
Market Waterproof, 1-10's.....	50¢
G. D.	38¢
S. B.	30¢
Union Metallic Cartridge Co.	
F. C. Trimm'd.....	50¢
F. L. Ground.....	55¢
Cent. Fire Ground.....	70¢
Db'l. Waterproof.....	\$1.40
Db'l. Waterproof, in 1-10's.....	\$1.40
S. B. Genuine Imp. orded.....	45¢
Eley's E. B.	54¢
Eley's D Waterproof, Central Fire.....	\$1.00
Cartridges.	
Rim Fire Cartridges.....	50¢
Rim Fire Military.....	55¢
Cent. Fire, Pistol and Rifle.....	55¢
Cent. Fire, Military and Sporting.....	55¢
Blank Cartridges, except 29 and 32 cal., additional 10¢ on above discounts.	
Blank Cartridges, 29 cal.....	\$1.75, dis 2¢
Blank Cartridges, 32 cal.....	\$3.50, dis 2¢
Primed Shells and Bullets.....	15¢
B. B. Caps, Round Ball.....	\$1.75, dis 2¢
B. B. Caps, Con. Ball, Swgd.....	\$2.00, dis 2¢
Primers.	
Berdan Primers.....	\$1.00, dis 2¢
B. L. Caps (for Sturtevant Shells).....	\$1.00
All other Primers.....	\$1.20, dis 2¢
Shells.	
First quality, 4, 8, 10 and 12 gauge.....	25¢
First quality, 14, 16 and 20 gauge (10 list).....	30¢
Star, Club, Rival and Climax brands, 10 and 12 gauge.....	35¢
Club, Rival and Climax brands, 14, 16 and 20 gauge.....	30¢
Selbold's Comb. Shot Shells.....	15¢
Brass Shot Shells, 1st quality.....	60¢
Brass Shot Shells, Club, Rival, Climax.....	65¢
I. X. L. 10 and 12 gauge.....	40¢
"Special," 16 gauge.....	30¢
"Special," 10 and 12 gauge.....	40¢
Fowler's Pat.....	\$3.25
Shells Loaded—	
A. M. Co. List No. 19, 1887.....	20¢
Wads—	
U. M. C. & W. R. A.—B. E., 11 up.....	\$2.00
U. M. C. & W. R. A.—B. E., 9&10.....	2.30
U. M. C. & W. R. A.—B. E., 7&8.....	2.00
U. M. C. & W. R. A.—P. E., 11 up.....	3.10
U. M. C. & W. R. A.—P. E., 9&10.....	2.80
U. M. C. & W. R. A.—P. E., 7&8.....	2.50
Eley's B. E., 11 up.....	\$1.75
Eley's P. E., 11 up.....	2.80
Anvils.—	
Eagle Anvils.....	\$104, dis 20¢
Peter Wright's.....	95¢
Armstrong's Mouse Hole.....	84¢
Armstrong's Mouse Hole, Extra 11.....	\$11.14
Trenton.....	9¢
Wilkinson's.....	9¢
J. & Riley Carr, Pat. Solid.....	11¢
Moore & Barnes Mfg. Co.....	33¢
Anvil Vise and Drill—	
Millers Falls Co.....	\$18.00, dis 20¢
Cheney Anvil and Vise.....	25¢
Allen Combined Anvil and Vise.....	\$3.00, dis 40¢

Apple Parers—	
Advance.....	\$ dos 4.75
Antrim Combination.....	\$ dos 5.50
Baldwin.....	\$ dos 5.25
Champion.....	\$ dos 7.25
Eureka, 1888.....	each 17.00
Family Bay State.....	\$ dos 12.00
Gem.....	\$ dos 4.00
Gold Medal.....	\$ dos 3.75
Hudson's New 88.....	\$ dos 4.75
Ideal.....	\$ dos 30.00
Improved Bay State.....	\$ dos 5.00
Little Star.....	\$ dos 13.50
Monarch.....	\$ dos 4.00
New Lightning.....	\$ dos 4.00
Orion.....	\$ dos 4.00
Penn.....	\$ dos 4.00
Perfection.....	\$ dos 4.00
Pomona.....	\$ dos 4.00
Rocking Table.....	\$ dos 6.00
Turntable.....	\$ dos 4.50
Victor.....	\$ dos 4.50
Waverly.....	\$ dos 4.50
White Mountain.....	\$ dos 4.25
72.....	\$ dos 4.75
76.....	\$ dos 5.75
78.....	\$ dos 6.50

Augers and Bits—	
Douglas Mfg. Co.....	70¢
Wm. A. Ives & Co.....	70¢
Humphreysville Mfg. Co.....	70¢
French, Swift & Co. (P. H. Beecher).....	55¢
Cook's, Douglas Mfg. Co.....	55¢
Cook's, N. H. Copper Co.....	50¢
Ives' Circular Lip.....	60¢
Patent Solid Head.....	60¢
C. E. Jennings & Co., No. 10, extension.....	40¢
hip.....	40¢
C. E. Jennings & Co., No. 30.....	40¢
C. E. Jennings & Co., Auger Bits, 7 set, 2 3/4 quarters, No. 5, 36; No. 30, 33, dis 20¢	
Lewis' Patent Single Twist.....	45¢
Jennings' Augers and Bits.....	60¢
Imitation Jennings' Bits.....	60¢
Pugh's Black.....	50¢
Car Bits.....	50¢
L'Hommedieu's Car Bits.....	15¢
Forster Pat. Auger Bits.....	10¢

Hollow Augers—

Ives' French, Swift & Co.....	25¢
Douglas.....	25¢
Bonney's Adjustable, 7 dos 48, dis 40¢	
Stearns.....	20¢
Ives' Expansive, each \$4.50.....	dis 50¢
Universal Expansive, each \$4.50.....	dis 20¢
Wood's.....	25¢

Expansive Bits—

Clark's small, 18; large, 28.....	35¢
Ives' No. 4, 7 dos 80.....	dis 40¢
Swan's.....	40¢
Stearns' No. 2, 48; No. 2, 32.....	dis 35¢
Stearns' No. 2, 48.....	dis 20¢

Gimlet Bits—

Common.....	\$ gross 2.75 to \$3.25
Diamond.....	\$ dos \$1.10; dis 25¢
"Bee".....	25¢
Double Cut, Shephardson's.....	45¢
Double Cut, Ct. Valley Mfg. Co.....	30¢
Double Cut, Hartwell's, 7 gro.....	55¢
Double Cut, Douglas.....	40¢
Double Cut, Ives.....	60¢

Bit Stock Drills—

Morse Twist Drills.....	50¢
Standard.....	50¢
Cleveland.....	50¢
Syracuse, for metal.....	50¢
Syracuse, for wood (wood list).....	30¢
Williams' or Holt's, for metal.....	50¢
Williams' or Holt's, for wood.....	40¢

Ship Augers and Bits—

L'Hommedieu's.....	15¢
Watrous.....	15¢
Snell's.....	15¢
Snell's Ship Auger Pat's Car Bits.....	15¢

Awl Hafts—

Sewing, Brass Fer. 7 gr, \$3.50.....	45¢
Pat. Sewing, Short, \$1.00 7 gr, dis 40¢	
Pat. Sewing, Long.....	\$ dos \$1.20
Pat. Peg, Plain Top.....	45¢
Pat. Peg, Leather Top.....	\$ gr \$10.00, 45¢

Awls, Brad Sets, &c—

Awls, Sewing, Common.....	\$ gr \$1.70, 35¢
Awls, Should. Peg.....	\$ gr \$2.45, 40¢
Awls, Pat. Peg.....	\$ gr 63¢, dis 40¢
Awls, Shouldered Brad.....	2.70 \$ gr, dis 35¢
Awls, Handled Brad.....	\$7.50 \$ gr, dis 45¢
Awls, Handled Scratch.....	\$ gr \$7.00, 35¢
Awls, Socket Scratch.....	\$ dos, \$1.50, 25¢

Awl and Tool Sets—

Alken's Sets, Awls and Tools, No. 20.....	\$ dos \$10.00, dis 55¢
Fray's Adj. Tool Hds., No. 1.....	\$12, 2, 18; dis 25¢
Miller's Falls Adj. Tool Hds., Nos. 1, 12, 2, 18; dis 25¢	
Henry's Combination Haft.....	\$ dos \$6.50
Brad Sets, No. 42, \$10.50; No. 43, \$12.50.....	dis 70¢
Brad Sets, Stanley's Excelsior.....	\$ dos \$7.50, dis 30¢
No. 1.....	\$4.00, dis 30¢
No. 2.....	\$4.00, dis 30¢
No. 3.....	\$5.50, dis 30¢

Axes—

Makers' and Special Brands—	
First quality.....	\$ dos \$6.00 to \$6.50
Others.....	\$ dos \$5.50 to \$5.75

Axle Grease—

Fraser's.....	Keg \$ 4¢, Pail \$ 5¢ net
Fraser's, in boxes.....	\$ gr \$9.50
Dixon's Everlasting, in bxs.....	\$ dos 1.10
Dixon's Everlasting.....	\$ gr \$5.50 to \$7.00
Lower grades, special brands.....	

Axles—

No. 1.....	4¢
No. 2.....	5¢
Nos. 7 to 18.....	50¢
Nos. 19 to 22.....	60¢
National Wrought Steel Tubular Self-Oiling.....	Standard Farm (1 to 5) and Special Farm (A1 to A5):
Less than 10 sets.....	33¢
Over 10 sets.....	33¢

Bag Holders.

Sprengle's Pat.....	\$ dos \$18, dis 60¢
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Balances—

Spring Balances.....	50¢
Common 24-lb.....	\$ dos \$1.50, dis 50¢
Chattillon's Spring Balances.....	50¢
Chattillon's Circular Spring Balances.....	60¢

Bells—

Hand—

Light Brass.....	70¢
Extra Heavy.....	80¢
White Metal.....	60¢
Shiver Chime.....	39¢
Globe (Cone's Patent).....	25¢

Door—

Gong, Abbe's.....	33¢
Gong, Yankee.....	45¢
Gong, Barton's.....	40¢
Crank, Taylor's.....	25¢
Crank, Brooks.....	50¢
Crank, Cone's.....	10¢

Crank, Connel's.....	20¢
Lever, Sargent's.....	60¢
Lever, Taylor's Bronzed or Plated.....	net
Lever, Taylor's Japanned.....	55¢
Lever, R. E. M. Co's.....	50¢
Pull, Brooks.....	50¢
Pull, Western.....	25¢

Cow—

Common Wrought.....	60¢
Western, Sargent's list.....	70¢
Kentucky "Star".....	20¢
Kentucky, Sargent's list.....	70¢
Dodge, Genuine Kentucky.....	70¢
Texas Star.....	50¢
Call.....	40¢
Farm Bells.....	\$ 3¢
Steel Alloy Church and School Bells.....	40¢

Bellows—

Blacksmiths'.....	50¢
Molders'.....	40¢
Hand Bellows.....	40¢

Belting, Rubber—

Common Standard.....	70¢
Standard.....	70¢
Extra.....	60¢
N. Y. B. & P. Co., Carbon.....	60¢
N. Y. B. & P. Co., Diamond.....	50¢

Bench Stops—

Morrill's.....	\$ dos \$2, dis 50¢
Hotchkiss'.....	\$ dos \$5, dis 10¢
Weston's, No. 1, \$10; No. 2, \$9.....	dis 10¢
McGill's.....	\$ dos \$3, dis 10¢

Bits—

Auger, Gimlet, Bit Stock, Drills, &c., see Augers and Bits.	
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Bit Holders—

Extension, Barber's, 7 dos \$15.00, dis 40¢	
Extension, Ives, 7 dos \$20.00, dis 60¢	
Diagonal.....	\$ dos \$24.00, dis 40¢
Angular.....	\$ dos \$24.00, dis 40¢

Blind Adjusters—

Domestic.....	\$ dos \$3.00, dis 33¢
Excelsior.....	\$ dos \$10.00, dis 50¢
Washington's Self-Locking.....	20¢

Blind Fasteners—

Macrell's, 7 dos \$1.00.....	dis 20¢
Van Sand's Screw Pat., \$15 \$ gr.....	80¢
Van Sand's Old Pat., \$15.00 \$ gr.....	55¢
Washburn's Old Pattern.....	\$9.00 \$ gr net
Merriman's.....	new list, net
Austin & Eddy No. 2008.....	\$9.00 \$ gr net
Security Gravity.....	\$9.00 \$ gr net

Blind Staples—

Barbed, 1/4 in. and larger.....	\$ 7 1/2¢ net
Barbed, 3/4 in. and larger.....	\$ 8 1/2¢ net

Blocks—

Cleveland Block Co., Mal. Iron.....	50¢
Novelty Tackle Blocks, Mal. Iron.....	50¢

Bolts—

Door and Shutter—	
Cast Iron Barrel, Square, &c.....	70¢
Cast Iron Shutter Bolts.....	70¢
Cast Iron Chain (Sargent's list).....	55¢
Ives' Patent Door Bolts.....	60¢
Wrought Barrel.....	70¢
Wrought Square.....	70¢
Wrt Shutter, all Iron, Stanley's.....	60¢
Wrt Shutter, Brass Knob.....	40¢
Wrt Shutter, Sargent's list.....	60¢
Wrt Sunk Flush, Sargent's list.....	50¢
Wrt Sunk Flush, Stanley's list.....	50¢
Wrt B.K. Flush, Com'n.....	55¢

Carriage, Machine, &c.—

Com. list June 10, '84.....	75¢
Genuine Eagle, list Oct. '84.....	75¢
Phila. pattern, list Oct. '84.....	75¢
R.B. & W., old list.....	70¢
Machine, according to size.....	75¢
Bolt Ends, according to size.....	75¢

Tire—

Common, list Feb. 28, '83.....	70¢
P.C.B. & N. Co., Empire, list Feb. 28, '83.....	70¢
P.C.B. & N. Co., Phila., list Oct. '84.....	82¢
P.C.B. & N. Co., Keystone, Philadel., list Oct. '84.....	80¢
P.C.B. & N. Co., Norway, Philadel., list Oct. '84.....	75¢
Am.S. Co., Eagle, Phil., list Oct. 16, '84.....	80¢
Am.S. Co., Philadel., list Oct. 16, '84.....	82¢
Am.S. Co., Bay State, list Feb. 28, '83.....	70¢
R.B. & W., Philadel., list Oct. 16, '84.....	82¢
R. & E. Mfg. Co.....	70¢

Stove and Plover—

Stove.....	62¢
Plover.....	60¢
Am. S. Co. Stove, Annealed.....	62¢
R. B. & W., Plover.....	62¢
R. & E. Mfg. Co., Stove.....	62¢

Borax—

Without.....	\$ 9¢
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Boring Machines—

Without	
Augers. Upright. Angular. Dis.....	5¢
Douglas.....	\$6.50 to \$7.75
Snell's, Rice's Pat.....	6.75
Jennings.....	5.50
Other Machines.....	2.35
Phillips' Patent.....	7.00
with Augers.....	7.50

Bow Pins—

Humason, Beckley & Co's.....	60¢
Sargent & Co's.....	51¢
Peck, Stow & W. Co.....	50¢

Braces—

Backus.	
Nos. 110 to 114 & 31 to 33.....	60¢
Nos. 6, 8, 12, 14.....	60¢
Nos. 16, 18, 20, 22, 7, 9, 11.....	70¢
Barber's.	
Nos. 10 to 16.....	50¢
Nos. 30 to 33.....	50¢
Nos. 40 to 63.....	50¢

Barker's.	
Nos. 8, 10 and 12.....	75¢
Plated, Nos. 8, 10 and 12.....	65¢
Osgood's Ratchet.....	40¢
Spofford's.....	50¢
Ives' New Haven Novelty.....	70¢</

Cards—
Horse & Curry.....10&10&10&10%
Cotton.....New list, Aug., 1888,
10&10&10%
Wool.....New list, Aug., 1888,
10&10&10%

Carpet Stretchers—
Cast Steel, Polished.....\$ doz \$2.25
Cast Iron, Steel Points.....\$ doz \$0.6
Socket.....\$ doz \$1.75
Bullard's.....25&25&10%

Carpet Sweepers—
Bissell No. 5.....\$ doz \$17.00
Bissell No. 7 New Drop Pan.....\$ doz \$19.00
Bissell, Grand.....\$ doz \$36.00
Grand Rapids.....\$ doz \$24.00
Crown Jewel, No. 1, \$18.00; No. 2,
\$19.00; No. 3, \$20.00
Magic.....\$ doz \$15.00
Jewel.....\$ doz \$17.00
Improved Parlor Queen, Nickel
\$ doz \$27.00
Improved Parlor Queen, Japaned
\$ doz \$24.00
Excelsior.....\$ doz \$22.00
Garland.....\$ doz \$18.00
Parlor Queen.....\$ doz \$24.00
Housewife's Delight.....\$ doz \$15.00
Queen.....\$ doz \$16.00
Queen, with band.....\$ doz \$30.00
King.....\$ doz \$18.00
Weed, Improved.....\$ doz \$16.00
Hub.....\$ doz \$16.00
Cog-Wheel.....\$ doz \$22.00
Conqueror.....\$ doz \$22.00
Easy.....\$ doz \$22.00
Monarch.....\$ doz \$21.00
Goshen.....\$ doz \$18.00
Advance.....\$ doz \$18.00
Ladies' Friend, No. 1, \$ doz, \$15.00;
No. 2.....\$ doz \$16.00
American.....\$ doz \$15.00
Grand Republic.....\$ doz \$35.00

Cartridges—
See Ammunition.

Casters—
Bed.....New list:
Plate.....55&55&5%
Shallow Socket.....60&60&5%
Deep Socket.....40&10%
Yale Casters, list May, 1884.....30&10&40%
Yale, Gem.....60&60&5%
Martin's Patent (Phoenix).....45&10&50%
Payson's Anti-Friction.....60&60&10%
"Giant" Truck Casters.....10&10&5%
Stationary Truck Casters.....45&10%

Cattle Leaders—
Humason, Beckley & Co.'s.....70%
Sargent's.....60&10%
Hotchkiss.....30%
Peck, Stow & W. Co.....50&10%

Chain—
Trace, 6-10-2, exact, \$ pair, \$1.03
50&10&50&10&5%
Trace, 6-10-3, exact, \$ pair \$2.4
50&10&50&10&5%
Trace, 7-10-2, exact, \$ pair \$1.11
50&10&50&10&5%
NOTE—Traces, "Regular" sizes, 3/4 net
\$ pair less than exact.

Log, Fifth, Stretcher, and other fancy
Chains, list Nov. 1, 1884
50&10&50&10&5%

Chain—
American Coll., list of June 20, 1887
3-16 5-16 1/2
In case lots.....\$8.75 6.25 5.00 4.20
American Coll., list of June 20, 1887
7-16 5-16 1/2
In case lots.....\$4.40 4.00 3.75 3.50
Less than case lots, add 1/4¢ per lb.

German Coll., list of June 20, 1887
50&10&50&10&5%
German Halter Chain, list of June 20,
1887.....50&10&50&10&5%
Covert Halter, Hitching and Breast
50&10%
Covert Traces.....35&2%
Onelida Halter Chain.....60&60&5%
Galvanized Pump Chain.....\$ 55¢ per lb.
Jack Chain, Iron.....\$ 55¢ per lb.
Jack Chain, Brass.....70&70&5%

Chalk—
White.....\$ gr 50¢
Red.....\$ gr 70¢
Blue.....\$ gr 85¢
White Crayons.....\$ gr 12¢ per 12¢, dis 10%

Chalk Lines—
See Lines.

Chisels—
Socket Framing and Firmer.
P. S. & W.....75&5&75&10%
New Haven and Middle-
sex.....75&5&75&10%
Mix.....75&5&75&10%
Ohio Tool Co.....30%
Buck Bros.....30%
Merrill.....60&10&60&10&5%
L. & I. J. White.....30&30&5%
Witherby & Douglas.....75&75&5%
Tanged and Miscellaneous.....40&10%
Tanged Firmers, Butcher's.....\$4.75&5.00
Tanged Firmers, Spear & Jackson's
\$5 to 2
Tanged Firmers, Buck Bros.....30%
Cold Chisels, \$ doz.....10&19¢

Chucks—
Beach Pat.....each, \$8.00, dis 20%
Morris Adjustable.....each, \$7.00, dis 20%
20&5%
Danbury.....each, \$6.00, dis 30&30&5%
Syracuse, Balz Pat.....25%
20&5%

Clamps—
Providence Tool Co.'s Wrought Iron.....25%
Adjustable, Gray's.....20%
Adjustable, Lambert's.....20%
Adjustable, Snow's.....40&5%
Adjustable, Hammers.....15%
Adjustable, Stearn's.....20&10%
Stearn's Adjustable Cabinet and Cor-
ner.....20&10%
Cabinet, Sargent's.....60&10%
Carriage Makers' Sargent's.....70&10%
Eberhard Mfg. Co.....40&5&40&10%
Warner's.....40&10&40&10&5%
Saw Clamps, see Vises.

Clips—
Norway, Axle, 1/4 & 5-16.....55&5&5%
Second grade Norway Axle, 1/4 & 5-16
65&5%
Superior Axle Clips.....60&5&60&5&5%

Norway Spring Bar Clips, 5-16, 60&5&5%
Wrought-Iron Felloe Clips.....\$ doz, 5¢
Steel Felloe Clips.....\$ doz, 5¢
Baker Axle Clips.....25%

Cockeyes—
50%

Cocks, Brass.
Hardware list.....40. & 10&2%

Coffee Mills—
Box and Side, list revised Jan. 1, 1888,
50&2%
American, Enterprise Mfg. Co. 20&10&30%
The "Swift," Lane Bros.....20&10%

Compasses, Dividers, &c—

Compasses, Calipers, Dividers, 70&70&10%
Bemis & Call Co.'s Dividers.....60&5%
Bemis & Call Co.'s Compasses & Cal-
ipers.....50&5%
Bemis & Call Co.'s Wing & Inside or
Outside.....50&5%
Bemis & Call Co.'s Double.....80%
Bemis & Call Co.'s (Call's Pat. Inside).....80%
Excelsior.....60%
J. Stevens & Co.'s Calipers and Dividers
25&10%
Starrett's Spring Calipers and Dividers
25&10%
Starrett's Lock Calipers and Dividers
25&10%
Starrett's Combination Dividers.....25&10%

Coopers' Tools—

Bradley's.....20%
Barton's.....20&25%
L. & I. J. White.....20&5%
Albertson Mfg. Co.....25%
Beatty's.....40&40&5%
Sandusky Tool Co.....30&30&5%

Corkscrews—

Humason & Beckley Mfg. Co. 40&40&10%
Clough's Pat.....35&40&5%
Howe Bros & Hulbert.....35%

Corn Knives and Cutters—

Bradley's.....10%
Wadsworth's.....25%

Cradles—

Grain.....50&2%

Crow Bars—

Cast Steel.....\$ doz, 4¢
Iron, Steel Points.....\$ doz, 3 1/2¢

Curry Combs—

Fitch's.....50&10&50&10&10%
Rubber.....per doz \$10.00, dis 20%
Perfect.....50%

Curtain Pins—

Silvered Glass.....net
White Enamel.....net

Cutlery—

Beaver Falls & Booth's.....35%
Wostenholme.....\$7.75 to 10

Dampers, &c—

Dampers, Buffalo.....50%
Buffalo Damper Clips.....50%
Crown Damper.....40%
Excelsior.....40&10%

Dividers—
See Compasses.

Dog Collars—

Embossed, Gilt, Pope & Steven's list
30&10%
Leather, Pope & Steven's list.....40%
Brass, Pope & Steven's list.....40%

Door Springs—

Torrey's Rod, regular size.....\$ doz \$1.30
Gray's.....\$ gr, \$20.00, dis 20%
Bee Rod.....\$ gr, \$20.00, dis 20%
Warner's No. 1, \$ doz, \$2.50; No. 2,
\$3.30; dis 40&10&50%

Gem (Coll), list April 19, 1886.....10%
Victor (Coll).....60&60&10%
Champion (Coll).....60&10&60&10&10%
Philadelphia.....5 in., \$5.00; 8 in., \$7.75;
dis 35%

Cowell's.....No. 1, \$ doz, \$18.00; No. 2,
\$15.00, dis 50%
Rubber, complete.....\$ doz, 50¢
Hercules.....55&10%
Shaw Door Check and Spring.....25&30&35%

Drawing Knives—

P. S. & W.....75&5&75&10%
Mix.....75&5&75&10%
New Haven and Middlesex.....75&5&75&10%
Merrill.....60&10&60&10&5%
Witherby and Douglas.....75&75&5%
Watrous.....15&10&25%

L. & I. J. White.....20&5%
Bradley's.....35%
Adjustable Handle.....25&35%
Wilkinson's Folding.....25&25&5%

Drills and Drill Stocks—

Blacksmiths'.....each \$1.75
Blacksmiths' Self-Feeding.....each \$7.50,
dis 20%
Breast, P. S. & W.....40&10%
Breast, Wilson's.....30&10%
Breast, Millers Falls.....each \$3.00, dis 25%
Breast, Bartholomew's.....each \$2.50, dis
25&10&40%

Ratchet, Merrill's.....20&20&5%
Ratchet, Ingersoll's.....25%
Ratchet, Parker's.....20&20&5%
Ratchet, Whitney's.....30&10%
Ratchet, Weston's.....20&25%
Ratchet, Moore's Triple Action.....25&30%
Whitney's Hand Drill, Plain, \$12.00;
Adjustable.....dis 20&10%
Wilson's Drill Stocks.....10%
Automatic Boring Tools.....each \$1.75;
\$1.85

Twist Drills—

Morse.....50&10&5%
Standard.....50&10&5%
Syracuse.....50&10&5%
Cleveland.....50&10&5%
Williams.....50&10&10%

Drill Bits.—See Augers and Bits.

Drill Chucks.—See Chucks.

Dripping Pans—

Small sizes.....\$ doz, 6¢
Large sizes.....\$ doz, 6¢

Egg Beaters.

Dover.....\$ doz \$2.00
National.....\$ doz \$4.50, dis 35%
Family (T. & S. Mfg. Co.), \$ gro \$17.00;
\$18.00

Duplex (Standard Co.).....\$ gro \$15.00
Rival (Standard Co.).....\$ gro \$12.00
Large Duplex (Standard Co.), \$ doz \$4.50
Triumph (T. & S. Mfg. Co.), \$ gro \$10.50

Advance, No. 1.....\$ gro \$10.50
Advance, No. 2.....\$ gro \$10.00
Bryant's.....\$ gro \$15.00
Ayres' Spiral.....\$ gro \$5.00
Double (Hamblin & Russell Mfg. Co.), \$
gro \$16.20

Easy (Hamblin & Russell Mfg. Co.), \$
gro \$14.00
Triple (Hamblin & Russell Mfg. Co.), \$
gro \$16.20
Spiral (Hamblin & Russell Mfg. Co.), \$
gro \$4.50

Paine, Diehl & Co.'s.....\$ gro \$24.00

Egg Poachers—

Buffalo Steam Egg Poachers, \$ doz, No.
1, \$6.00; No. 2, \$6.00, dis 25%

Electric Bell Sets.—

Wollensak's.....20%
Bigelow & Dowse.....20%

Emery— No. 4 to No. 54 to Flour, CF
46 gr. 150 gr. F F F.

Kegs, \$ doz.....4¢ 5¢ 2 1/2¢
1/4 kegs, \$ doz.....4 1/2¢ 5 1/2¢ 2 1/2¢
1/2 kegs, \$ doz.....4 1/2¢ 5 1/2¢ 3¢
10-b cans, 10
in case.....6¢ 6 1/2¢ 5¢
10-b cans, less
than 10.....10¢ 10¢ 7 1/2¢

Enameled and Tinned Ware—
See Hollow-Ware.

Escatchoon Pins—

Iron, list Nov. 11, 1885.....50&10&50&10&5%
Brass.....60&60&5%

Escatchoons.

Door Lock.....Same dis as Door Locks.
Brass Thread.....60&60&10%
Wood.....25%

Faucets.—

Fenn's.....40%
Bohren's Pat. Rubber Ball.....25%
Fenn's Cork Stops.....35%
Star.....60%
Fenn's Pat. Petroleum.....40&5%
Fenn's Pat. Key.....50&10%
Anchor Lock.....45%
Metallic Key, Leather Lined.....60&10%
Cork Lined.....70&5&70&10%
Burnside's Red Cedar.....50%
Burnside's Red Cedar, bbl lots.....50&10%
John Sommers.....40%

Peerless Best Block Tin Key.....40%
IXL, 1st quality, Cork Lined.....50%
Diamond Lock.....40%
Perfection, Fla. Red Cedar.....50%
Goodenough Cedar.....50%
Russo's Pat. Key.....50%
Reliable Cork Lined.....60%
Western Pattern Cork Lined.....50%
Self-Measuring Enterprise, \$ doz \$50.00,
dis 20&10%
Self-Measuring, Lane's, \$ doz \$36.00,
dis 25&10%
Self-Measuring, Victor, \$ doz \$36.00,
dis 25&10%

Felloe Plates......\$ doz 6¢

Fifth Wheels.—

Derby and Cincinnati.....45&5%

Files—

Domestic.....60&5&60&10%
Nicholson Files, Rasps, &c. 60&5&60&10%
Nicholson (X. F.) Files.....25%
Nicholson's Royal Files (Seconds)
75% (extra prices on certain sizes)
Other makers, best brands.....60&5&60&10%
Fair brands.....60&10&10&70%
Second quality.....70&5&70%
Heller's Horse Rasps.....50&7 1/2¢
McCaffrey's Horse Rasps.....50&10%

Imported—

J. & Riley Carr.....list, April 1, 1888, 15%
J. & Riley Carr Horse Rasps.....10%
Moss & Gamble.....list, April 1, 1888, 15%
Butcher.....Butcher's list, 20%
Stubs.....Stubs list, 20&30%
Turkton's.....Turkton's list, 20&25%
Greaves' Horse Rasps.....American list, 60%

Fluting Machines—

Knox, 4 1/2-inch Rolls.....\$3.25 each } 35%
Knox, 6-inch Rolls.....\$3.50 each } 35%
Eagle, 3 1/2-inch Roll.....\$2.15, dis 35%
Eagle, 5 1/2-inch Roll.....\$2.85, dis 35%
Crown, 4 1/2 in., \$3.50; 6 in., \$4.00; 8 in.,
\$6.50 each.....dis 35%
Crown Jewel, 6 in.....\$3.50 each, 35%
American, 5 in., \$3.00; 6 in., \$3.40; 7 in.,
\$4.50 each.....dis 35%
Domestic Fluter.....\$1.50 each net
Geneva Hand Fluter, White Metal,
\$ doz \$12, dis 25%
Crown Hand Fluter, Nos. 1, \$15.00; 2,
\$12.50; 3, \$10.00.....dis 30%
Shepard Hand Fluter, No. 85 \$ doz
\$15.30.....dis 40%
Brad A W.....\$11.00.....dis 40%
Shepard Hand Fluter, No. 95 \$ doz
\$8.00.....dis 40%
Clark's Hand Fluter, \$ doz \$15.00, dis 35%
Combined Fluter and Sad Iron,
\$ doz \$15.00, dis 30%
Buffalo.....\$ doz \$10.00, dis 10%

Fluting Scissors......45%

Fodder Squeezers—

Blair's.....\$ doz \$2.00
Blair's "Climax".....\$ doz \$1.25

Forks—

Hay, Manure, &c., Asso. List.....65%
Hay, Manure, &c., Phila. List.....60&60&5%
Plated, see Spoons.

Freezers, Ice Cream—

Buffalo Champion.....60&10&5%
Shepard's Lightning.....65%
White Mountain.....60%

Fruit and Jelly Presses—

Enterprise Mfg. Co.....20&10&30%
Henis.....\$ doz \$3.75&4.00
P. D. & Co.....\$ doz \$3.75&4.00
Shepard's Queen City.....40%

Fry Pans—

High List.....75&5&75&10
No.....0 1 2 3 4
\$ doz. \$3.75 \$4.70 \$5.30 \$5.95 \$6.55

No.....5 6 7 8
\$ doz.....\$7.50 \$8.75 \$10.00 \$11.25

Low List.....65&10%
No.....0 1 2 3
\$ doz. \$5.00 \$5.75 \$4.25 \$4.75 \$5.25

No.....4 5 6 7 8
\$ doz.....\$6.00 \$7.00 \$8.00 \$9.00

Fuse— \$ 1000 ft.

Common Hemp Fuse, for dry ground.....\$2.70
Common Cotton Fuse, for dry ground 2.85
Single Taped Fuse, for wet ground.....4.75
Double Taped Fuse, for very wet gr.....6.00
Triple Taped Fuse, for very wet gr.....7.25
Small Gutta Percha Fuse, for water.....7.50
Large Gutta Percha Fuse, for water.....12.00

Gauges—

Marking, Mortise, &c.....60&10%
Starrett's Surface, Center and Scratch,
25&10%
Wire, low list.....10&10%
Wire, Wheeler, Madden & Co.....10%
Wire, Morse's.....60&60&5%
Wire, Brown & Sharpe's.....10&20%

Glimlets—

Nail and Spike.....50&10&5%
"Eureka" Glimlets.....40&10%
"Diamond" Glimlets.....\$ gr \$5.00
Double Cut, Shepardson's.....45&45&5%
Double Cut, Ives.....60&60&5%
Double Cut, Douglass.....40&10%
"Bee".....\$ gr \$12, dis 25&25&5%

Glue—

Le Page's Liquid.....25&25&5%
Upton's Liquid.....35%
Le Page & Co.'s Improved Process
25&25&5%

Glue Pots—

Tinned and Enameled.....40&5&40&10%
Family, Howe's "Eureka".....40%
Family, L. F. C.'s "Handy".....50%

Grindstones—

Small, at factory.....\$ ton \$7.50&9.00

Grindstone Fixtures—

Sargent's Patent.....70&10%
Reading Hardware Co.....30&10%

Hack Saws.—

See Saws.

Halters—

Covert's, Rope, 1/4-in. Jute.....50&2%
Covert's, Rope, 1/4-in. Hemp.....40&5%
Covert's Adj. Rope Halters.....40&5%
Covert's Hemp Horse and Cattle Tie,
50&2%
Covert's Jute Horse and Cattle Ties,
60&10&2%

Hammers—

Handled Hammers—
Maydole's, list Dec. 1, '85.....25&25&10%
Buffalo Hammer Co. { List Jan. 15, '87
Humason & Beckley } 50&50&10%
Atha Tool Co.....40&10&50%
Fayette R. Plumb.....40&10&50%
C. Hammond & Son.....40&10%
Verres.....5%
Magnetic Tack, Nos. 1, 2, 3, \$1.25, 1.50 &
1.75.....dis 30&10%
Nelson Tool Works.....40&10%
Warner & Nobles.....20&25%
Peck, Stow & Wilcox.....40%
Sargent's.....35&10%

Heavy Hammers and Sledges—

3 lb and under.....\$ doz 40¢ } dis 60&10%
3 to 5 lb.....\$ doz 36¢ } \$10 to 70%
Over 5 lb.....\$ doz 36¢ }
Wilkinson's Smiths.....10¢ per lb

Handcuffs and Leg Irons—

Providence Tool Co., Handcuffs, \$15.00
\$ doz.....dis 10%
Providence Tool Co., Leg Irons, \$25.00
\$ doz.....dis 10%
Tower's.....dis 10%
Daley's Improved Handcuffs: 2 Hands,
Polished, \$ doz \$48.00; Nickel-
ed, \$72.00; 3 Hands, Polished, \$ doz
\$72.00; Nickel-ed, \$84.00.....dis 25%

Handles—

Iron, Wrought or Cast—

Door or Thumb.....
Nos.....0 1 2 3 4
Per doz.....\$0.90 1.00 1.18 1.35 1.50

Cross-Cut Saw Handles—
 Atkins' No. 1 Loop, pair, 30¢; No. 3, 22¢; No. 2 and No. 4 Reversible, 22¢.
 Boynton's Loop Saw Handles, 50¢, dis 60¢.
 Champion.....15¢

Hangers—
 Barn Door, old patterns.....60¢10¢10¢70¢
 Barn Door, New England, 60¢10¢10¢70¢
 Samson Steel Anti-Friction.....55¢
 Orleans Steel.....55¢
 Hamilton Wrought Wood Track.....55¢
 U. S. Wood Track.....55¢
 Champion.....60¢10¢
 Rider and Wooster, Medina Mfg. Co.'s
 List.....70¢
 Climax Anti-Friction.....70¢
 Climax Steel Anti-Friction.....50¢
 Zenith for Wood Track.....55¢
 Reed's Steel Arm.....50¢
 Challenge, Barn Door.....50¢
 Sterling's Imp'ved (Anti-Friction) 55¢10¢
 Victor, No. 1, \$15.00; No. 2, \$16.50; No. 3, \$18.00.....dis 50¢10¢
 Charlier.....60¢10¢
 Kiddier.....50¢10¢90¢
 The "Boss".....60¢
 Best Anti-Friction.....60¢
 Duplex (Wood Track).....60¢
 Terry's Pat. 4 in. 10¢, 5 in. 12¢, 6 in. 15¢, 8 in. 20¢, 10 in. 25¢, 12 in. 30¢, 14 in. 35¢, 16 in. 40¢, 18 in. 45¢, 20 in. 50¢, 22 in. 55¢, 24 in. 60¢, 26 in. 65¢, 28 in. 70¢, 30 in. 75¢, 32 in. 80¢, 34 in. 85¢, 36 in. 90¢, 38 in. 95¢, 40 in. 1.00, 42 in. 1.05, 44 in. 1.10, 46 in. 1.15, 48 in. 1.20, 50 in. 1.25, 52 in. 1.30, 54 in. 1.35, 56 in. 1.40, 58 in. 1.45, 60 in. 1.50, 62 in. 1.55, 64 in. 1.60, 66 in. 1.65, 68 in. 1.70, 70 in. 1.75, 72 in. 1.80, 74 in. 1.85, 76 in. 1.90, 78 in. 1.95, 80 in. 2.00, 82 in. 2.05, 84 in. 2.10, 86 in. 2.15, 88 in. 2.20, 90 in. 2.25, 92 in. 2.30, 94 in. 2.35, 96 in. 2.40, 98 in. 2.45, 100 in. 2.50, 102 in. 2.55, 104 in. 2.60, 106 in. 2.65, 108 in. 2.70, 110 in. 2.75, 112 in. 2.80, 114 in. 2.85, 116 in. 2.90, 118 in. 2.95, 120 in. 3.00, 122 in. 3.05, 124 in. 3.10, 126 in. 3.15, 128 in. 3.20, 130 in. 3.25, 132 in. 3.30, 134 in. 3.35, 136 in. 3.40, 138 in. 3.45, 140 in. 3.50, 142 in. 3.55, 144 in. 3.60, 146 in. 3.65, 148 in. 3.70, 150 in. 3.75, 152 in. 3.80, 154 in. 3.85, 156 in. 3.90, 158 in. 3.95, 160 in. 4.00, 162 in. 4.05, 164 in. 4.10, 166 in. 4.15, 168 in. 4.20, 170 in. 4.25, 172 in. 4.30, 174 in. 4.35, 176 in. 4.40, 178 in. 4.45, 180 in. 4.50, 182 in. 4.55, 184 in. 4.60, 186 in. 4.65, 188 in. 4.70, 190 in. 4.75, 192 in. 4.80, 194 in. 4.85, 196 in. 4.90, 198 in. 4.95, 200 in. 5.00, 202 in. 5.05, 204 in. 5.10, 206 in. 5.15, 208 in. 5.20, 210 in. 5.25, 212 in. 5.30, 214 in. 5.35, 216 in. 5.40, 218 in. 5.45, 220 in. 5.50, 222 in. 5.55, 224 in. 5.60, 226 in. 5.65, 228 in. 5.70, 230 in. 5.75, 232 in. 5.80, 234 in. 5.85, 236 in. 5.90, 238 in. 5.95, 240 in. 6.00, 242 in. 6.05, 244 in. 6.10, 246 in. 6.15, 248 in. 6.20, 250 in. 6.25, 252 in. 6.30, 254 in. 6.35, 256 in. 6.40, 258 in. 6.45, 260 in. 6.50, 262 in. 6.55, 264 in. 6.60, 266 in. 6.65, 268 in. 6.70, 270 in. 6.75, 272 in. 6.80, 274 in. 6.85, 276 in. 6.90, 278 in. 6.95, 280 in. 7.00, 282 in. 7.05, 284 in. 7.10, 286 in. 7.15, 288 in. 7.20, 290 in. 7.25, 292 in. 7.30, 294 in. 7.35, 296 in. 7.40, 298 in. 7.45, 300 in. 7.50, 302 in. 7.55, 304 in. 7.60, 306 in. 7.65, 308 in. 7.70, 310 in. 7.75, 312 in. 7.80, 314 in. 7.85, 316 in. 7.90, 318 in. 7.95, 320 in. 8.00, 322 in. 8.05, 324 in. 8.10, 326 in. 8.15, 328 in. 8.20, 330 in. 8.25, 332 in. 8.30, 334 in. 8.35, 336 in. 8.40, 338 in. 8.45, 340 in. 8.50, 342 in. 8.55, 344 in. 8.60, 346 in. 8.65, 348 in. 8.70, 350 in. 8.75, 352 in. 8.80, 354 in. 8.85, 356 in. 8.90, 358 in. 8.95, 360 in. 9.00, 362 in. 9.05, 364 in. 9.10, 366 in. 9.15, 368 in. 9.20, 370 in. 9.25, 372 in. 9.30, 374 in. 9.35, 376 in. 9.40, 378 in. 9.45, 380 in. 9.50, 382 in. 9.55, 384 in. 9.60, 386 in. 9.65, 388 in. 9.70, 390 in. 9.75, 392 in. 9.80, 394 in. 9.85, 396 in. 9.90, 398 in. 9.95, 400 in. 10.00, 402 in. 10.05, 404 in. 10.10, 406 in. 10.15, 408 in. 10.20, 410 in. 10.25, 412 in. 10.30, 414 in. 10.35, 416 in. 10.40, 418 in. 10.45, 420 in. 10.50, 422 in. 10.55, 424 in. 10.60, 426 in. 10.65, 428 in. 10.70, 430 in. 10.75, 432 in. 10.80, 434 in. 10.85, 436 in. 10.90, 438 in. 10.95, 440 in. 11.00, 442 in. 11.05, 444 in. 11.10, 446 in. 11.15, 448 in. 11.20, 450 in. 11.25, 452 in. 11.30, 454 in. 11.35, 456 in. 11.40, 458 in. 11.45, 460 in. 11.50, 462 in. 11.55, 464 in. 11.60, 466 in. 11.65, 468 in. 11.70, 470 in. 11.75, 472 in. 11.80, 474 in. 11.85, 476 in. 11.90, 478 in. 11.95, 480 in. 12.00, 482 in. 12.05, 484 in. 12.10, 486 in. 12.15, 488 in. 12.20, 490 in. 12.25, 492 in. 12.30, 494 in. 12.35, 496 in. 12.40, 498 in. 12.45, 500 in. 12.50, 502 in. 12.55, 504 in. 12.60, 506 in. 12.65, 508 in. 12.70, 510 in. 12.75, 512 in. 12.80, 514 in. 12.85, 516 in. 12.90, 518 in. 12.95, 520 in. 13.00, 522 in. 13.05, 524 in. 13.10, 526 in. 13.15, 528 in. 13.20, 530 in. 13.25, 532 in. 13.30, 534 in. 13.35, 536 in. 13.40, 538 in. 13.45, 540 in. 13.50, 542 in. 13.55, 544 in. 13.60, 546 in. 13.65, 548 in. 13.70, 550 in. 13.75, 552 in. 13.80, 554 in. 13.85, 556 in. 13.90, 558 in. 13.95, 560 in. 14.00, 562 in. 14.05, 564 in. 14.10, 566 in. 14.15, 568 in. 14.20, 570 in. 14.25, 572 in. 14.30, 574 in. 14.35, 576 in. 14.40, 578 in. 14.45, 580 in. 14.50, 582 in. 14.55, 584 in. 14.60, 586 in. 14.65, 588 in. 14.70, 590 in. 14.75, 592 in. 14.80, 594 in. 14.85, 596 in. 14.90, 598 in. 14.95, 600 in. 15.00, 602 in. 15.05, 604 in. 15.10, 606 in. 15.15, 608 in. 15.20, 610 in. 15.25, 612 in. 15.30, 614 in. 15.35, 616 in. 15.40, 618 in. 15.45, 620 in. 15.50, 622 in. 15.55, 624 in. 15.60, 626 in. 15.65, 628 in. 15.70, 630 in. 15.75, 632 in. 15.80, 634 in. 15.85, 636 in. 15.90, 638 in. 15.95, 640 in. 16.00, 642 in. 16.05, 644 in. 16.10, 646 in. 16.15, 648 in. 16.20, 650 in. 16.25, 652 in. 16.30, 654 in. 16.35, 656 in. 16.40, 658 in. 16.45, 660 in. 16.50, 662 in. 16.55, 664 in. 16.60, 666 in. 16.65, 668 in. 16.70, 670 in. 16.75, 672 in. 16.80, 674 in. 16.85, 676 in. 16.90, 678 in. 16.95, 680 in. 17.00, 682 in. 17.05, 684 in. 17.10, 686 in. 17.15, 688 in. 17.20, 690 in. 17.25, 692 in. 17.30, 694 in. 17.35, 696 in. 17.40, 698 in. 17.45, 700 in. 17.50, 702 in. 17.55, 704 in. 17.60, 706 in. 17.65, 708 in. 17.70, 710 in. 17.75, 712 in. 17.80, 714 in. 17.85, 716 in. 17.90, 718 in. 17.95, 720 in. 18.00, 722 in. 18.05, 724 in. 18.10, 726 in. 18.15, 728 in. 18.20, 730 in. 18.25, 732 in. 18.30, 734 in. 18.35, 736 in. 18.40, 738 in. 18.45, 740 in. 18.50, 742 in. 18.55, 744 in. 18.60, 746 in. 18.65, 748 in. 18.70, 750 in. 18.75, 752 in. 18.80, 754 in. 18.85, 756 in. 18.90, 758 in. 18.95, 760 in. 19.00, 762 in. 19.05, 764 in. 19.10, 766 in. 19.15, 768 in. 19.20, 770 in. 19.25, 772 in. 19.30, 774 in. 19.35, 776 in. 19.40, 778 in. 19.45, 780 in. 19.50, 782 in. 19.55, 784 in. 19.60, 786 in. 19.65, 788 in. 19.70, 790 in. 19.75, 792 in. 19.80, 794 in. 19.85, 796 in. 19.90, 798 in. 19.95, 800 in. 20.00, 802 in. 20.05, 804 in. 20.10, 806 in. 20.15, 808 in. 20.20, 810 in. 20.25, 812 in. 20.30, 814 in. 20.35, 816 in. 20.40, 818 in. 20.45, 820 in. 20.50, 822 in. 20.55, 824 in. 20.60, 826 in. 20.65, 828 in. 20.70, 830 in. 20.75, 832 in. 20.80, 834 in. 20.85, 836 in. 20.90, 838 in. 20.95, 840 in. 21.00, 842 in. 21.05, 844 in. 21.10, 846 in. 21.15, 848 in. 21.20, 850 in. 21.25, 852 in. 21.30, 854 in. 21.35, 856 in. 21.40, 858 in. 21.45, 860 in. 21.50, 862 in. 21.55, 864 in. 21.60, 866 in. 21.65, 868 in. 21.70, 870 in. 21.75, 872 in. 21.80, 874 in. 21.85, 876 in. 21.90, 878 in. 21.95, 880 in. 22.00, 882 in. 22.05, 884 in. 22.10, 886 in. 22.15, 888 in. 22.20, 890 in. 22.25, 892 in. 22.30, 894 in. 22.35, 896 in. 22.40, 898 in. 22.45, 900 in. 22.50, 902 in. 22.55, 904 in. 22.60, 906 in. 22.65, 908 in. 22.70, 910 in. 22.75, 912 in. 22.80, 914 in. 22.85, 916 in. 22.90, 918 in. 22.95, 920 in. 23.00, 922 in. 23.05, 924 in. 23.10, 926 in. 23.15, 928 in. 23.20, 930 in. 23.25, 932 in. 23.30, 934 in. 23.35, 936 in. 23.40, 938 in. 23.45, 940 in. 23.50, 942 in. 23.55, 944 in. 23.60, 946 in. 23.65, 948 in. 23.70, 950 in. 23.75, 952 in. 23.80, 954 in. 23.85, 956 in. 23.90, 958 in. 23.95, 960 in. 24.00, 962 in. 24.05, 964 in. 24.10, 966 in. 24.15, 968 in. 24.20, 970 in. 24.25, 972 in. 24.30, 974 in. 24.35, 976 in. 24.40, 978 in. 24.45, 980 in. 24.50, 982 in. 24.55, 984 in. 24.60, 986 in. 24.65, 988 in. 24.70, 990 in. 24.75, 992 in. 24.80, 994 in. 24.85, 996 in. 24.90, 998 in. 24.95, 1000 in. 25.00, 1002 in. 25.05, 1004 in. 25.10, 1006 in. 25.15, 1008 in. 25.20, 1010 in. 25.25, 1012 in. 25.30, 1014 in. 25.35, 1016 in. 25.40, 1018 in. 25.45, 1020 in. 25.50, 1022 in. 25.55, 1024 in. 25.60, 1026 in. 25.65, 1028 in. 25.70, 1030 in. 25.75, 1032 in. 25.80, 1034 in. 25.85, 1036 in. 25.90, 1038 in. 25.95, 1040 in. 26.00, 1042 in. 26.05, 1044 in. 26.10, 1046 in. 26.15, 1048 in. 26.20, 1050 in. 26.25, 1052 in. 26.30, 1054 in. 26.35, 1056 in. 26.40, 1058 in. 26.45, 1060 in. 26.50, 1062 in. 26.55, 1064 in. 26.60, 1066 in. 26.65, 1068 in. 26.70, 1070 in. 26.75, 1072 in. 26.80, 1074 in. 26.85, 1076 in. 26.90, 1078 in. 26.95, 1080 in. 27.00, 1082 in. 27.05, 1084 in. 27.10, 1086 in. 27.15, 1088 in. 27.20, 1090 in. 27.25, 1092 in. 27.30, 1094 in. 27.35, 1096 in. 27.40, 1098 in. 27.45, 1100 in. 27.50, 1102 in. 27.55, 1104 in. 27.60, 1106 in. 27.65, 1108 in. 27.70, 1110 in. 27.75, 1112 in. 27.80, 1114 in. 27.85, 1116 in. 27.90, 1118 in. 27.95, 1120 in. 28.00, 1122 in. 28.05, 1124 in. 28.10, 1126 in. 28.15, 1128 in. 28.20, 1130 in. 28.25, 1132 in. 28.30, 1134 in. 28.35, 1136 in. 28.40, 1138 in. 28.45, 1140 in. 28.50, 1142 in. 28.55, 1144 in. 28.60, 1146 in. 28.65, 1148 in. 28.70, 1150 in. 28.75, 1152 in. 28.80, 1154 in. 28.85, 1156 in. 28.90, 1158 in. 28.95, 1160 in. 29.00, 1162 in. 29.05, 1164 in. 29.10, 1166 in. 29.15, 1168 in. 29.20, 1170 in. 29.25, 1172 in. 29.30, 1174 in. 29.35, 1176 in. 29.40, 1178 in. 29.45, 1180 in. 29.50, 1182 in. 29.55, 1184 in. 29.60, 1186 in. 29.65, 1188 in. 29.70, 1190 in. 29.75, 1192 in. 29.80, 1194 in. 29.85, 1196 in. 29.90, 1198 in. 29.95, 1200 in. 30.00, 1202 in. 30.05, 1204 in. 30.10, 1206 in. 30.15, 1208 in. 30.20, 1210 in. 30.25, 1212 in. 30.30, 1214 in. 30.35, 1216 in. 30.40, 1218 in. 30.45, 1220 in. 30.50, 1222 in. 30.55, 1224 in. 30.60, 1226 in. 30.65, 1228 in. 30.70, 1230 in. 30.75, 1232 in. 30.80, 1234 in. 30.85, 1236 in. 30.90, 1238 in. 30.95, 1240 in. 31.00, 1242 in. 31.05, 1244 in. 31.10, 1246 in. 31.15, 1248 in. 31.20, 1250 in. 31.25, 1252 in. 31.30, 1254 in. 31.35, 1256 in. 31.40, 1258 in. 31.45, 1260 in. 31.50, 1262 in. 31.55, 1264 in. 31.60, 1266 in. 31.65, 1268 in. 31.70, 1270 in. 31.75, 1272 in. 31.80, 1274 in. 31.85, 1276 in. 31.90, 1278 in. 31.95, 1280 in. 32.00, 1282 in. 32.05, 1284 in. 32.10, 1286 in. 32.15, 1288 in. 32.20, 1290 in. 32.25, 1292 in. 32.30, 1294 in. 32.35, 1296 in. 32.40, 1298 in. 32.45, 1300 in. 32.50, 1302 in. 32.55, 1304 in. 32.60, 1306 in. 32.65, 1308 in. 32.70, 1310 in. 32.75, 1312 in. 32.80, 1314 in. 32.85, 1316 in. 32.90, 1318 in. 32.95, 1320 in. 33.00, 1322 in. 33.05, 1324 in. 33.10, 1326 in. 33.15, 1328 in. 33.20, 1330 in. 33.25, 1332 in. 33.30, 1334 in. 33.35, 1336 in. 33.40, 1338 in. 33.45, 1340 in. 33.50, 1342 in. 33.55, 1344 in. 33.60, 1346 in. 33.65, 1348 in. 33.70, 1350 in. 33.75, 1352 in. 33.80, 1354 in. 33.85, 1356 in. 33.90, 1358 in. 33.95, 1360 in. 34.00, 1362 in. 34.05, 1364 in. 34.10, 1366 in. 34.15, 1368 in. 34.20, 1370 in. 34.25, 1372 in. 34.30, 1374 in. 34.35, 1376 in. 34.40, 1378 in. 34.45, 1380 in. 34.50, 1382 in. 34.55, 1384 in. 34.60, 1386 in. 34.65, 1388 in. 34.70, 1390 in. 34.75, 1392 in. 34.80, 1394 in. 34.85, 1396 in. 34.90, 1398 in. 34.95, 1400 in. 35.00, 1402 in. 35.05, 1404 in. 35.10, 1406 in. 35.15, 1408 in. 35.20, 1410 in. 35.25, 1412 in. 35.30, 1414 in. 35.35, 1416 in. 35.40, 1418 in. 35.45, 1420 in. 35.50, 1422 in. 35.55, 1424 in. 35.60, 1426 in. 35.65, 1428 in. 35.70, 1430 in. 35.75, 1432 in. 35.80, 1434 in. 35.85, 1436 in. 35.90, 1438 in. 35.95, 1440 in. 36.00, 1442 in. 36.05, 1444 in. 36.10, 1446 in. 36.15, 1448 in. 36.20, 1450 in. 36.25, 1452 in. 36.30, 1454 in. 36.35, 1456 in. 36.40, 1458 in. 36.45, 1460 in. 36.50, 1462 in. 36.55, 1464 in. 36.60, 1466 in. 36.65, 1468 in. 36.70, 1470 in. 36.75, 1472 in. 36.80, 1474 in. 36.85, 1476 in. 36.90, 1478 in. 36.95, 1480 in. 37.00, 1482 in. 37.05, 1484 in. 37.10, 1486 in. 37.15, 1488 in. 37.20, 1490 in. 37.25, 1492 in. 37.30, 1494 in. 37.35, 1496 in. 37.40, 1498 in. 37.45, 1500 in. 37.50, 1502 in. 37.55, 1504 in. 37.60, 1506 in. 37.65, 1508 in. 37.70, 1510 in. 37.75, 1512 in. 37.80, 1514 in. 37.85, 1516 in. 37.90, 1518 in. 37.95, 1520 in. 38.00, 1522 in. 38.05, 1524 in. 38.10, 1526 in. 38.15, 1528 in. 38.20, 1530 in. 38.25, 1532 in. 38.30, 1534 in. 38.35, 1536 in. 38.40, 1538 in. 38.45, 1540 in. 38.50, 1542 in. 38.55, 1544 in. 38.60, 1546 in. 38.65, 1548 in. 38.70, 1550 in. 38.75, 1552 in. 38.80, 1554 in. 38.85, 1556 in. 38.90, 1558 in. 38.95, 1560 in. 39.00, 1562 in. 39.05, 1564 in. 39.10, 1566 in. 39.15, 1568 in. 39.20, 1570 in. 39.25, 1572 in. 39.30, 1574 in. 39.35, 1576 in. 39.40, 1578 in. 39.45, 1580 in. 39.50, 1582 in. 39.55, 1584 in. 39.60, 1586 in. 39.65, 1588 in. 39.70, 1590 in. 39.75, 1592 in. 39.80, 1594 in. 39.85, 1596 in. 39.90, 1598 in. 39.95, 1600 in. 40.00, 1602 in. 40.05, 1604 in. 40.10, 1606 in. 40.15, 1608 in. 40.20, 1610 in. 40.25, 1612 in. 40.30, 1614 in. 40.35, 1616 in. 40.40, 1618 in. 40.45, 1620 in. 40.50, 1622 in. 40.55, 1624 in. 40.60, 1626 in. 40.65, 1628 in. 40.70, 1630 in. 40.75, 1632 in. 40.80, 1634 in. 40.85, 1636 in. 40.90, 1638 in. 40.95, 1640 in. 41.00, 1642 in. 41.05, 1644 in. 41.10, 1646 in. 41.15, 1648 in. 41.20, 1650 in. 41.25, 1652 in. 41.30, 1654 in. 41.35, 1656 in. 41.40, 1658 in. 41.45, 1660 in. 41.50, 1662 in. 41.55, 1664 in. 41.60, 1666 in. 41.65, 1668 in. 41.70, 1670 in. 41.75, 1672 in. 41.80, 1674 in. 41.85, 1676 in. 41.90, 1678 in. 41.95, 1680 in. 42.00, 1682 in. 42.05, 1684 in. 42.10, 1686 in. 42.15, 1688 in. 42.20, 1690 in. 42.25, 1692 in. 42.30, 1694 in. 42.35, 1696 in. 42.40, 1698 in. 42.45, 1700 in. 42.50, 1702 in. 42.55, 1704 in. 42.60, 1706 in. 42.65, 1708 in. 42.70, 1710 in. 42.75, 1712 in. 42.80, 1714 in. 42.85, 1716 in. 42.90, 1718 in. 42.95, 1720 in. 43.00, 1722 in. 43.05, 1724 in. 43.10, 1726 in. 43.15, 1728 in. 43.20, 1730 in. 43.25, 1732 in. 43.30, 1734 in. 43.35, 1736 in. 43.40, 1738 in. 43.45, 1740 in. 43.50, 1742 in. 43.55, 1744 in. 43.60, 1746 in. 43.65, 1748 in. 43.70, 1750 in. 43.75, 1752 in. 43.80, 1754 in. 43.85, 1756 in. 43.90, 1758 in. 43.95, 1760 in. 44.00, 1762 in. 44.05, 1764 in. 44.10, 1766 in. 44.15, 1768 in. 44.20, 1770 in. 44.25, 1772 in. 44.30, 1774 in. 44.35, 1776 in. 44.40, 1778 in. 44.45, 1780 in. 44.50, 1782 in. 44.55, 1784 in. 44.60, 1786 in. 44.65, 1788 in. 44.70, 1790 in

Melasses Gates—		Plane Irons—		Razor Straps—		Atkins' Silver Steel Diamond X Cuts	
Stebbin's Pat.	70¢ 70¢ 70¢	Plane Irons, 20¢ 10%		Genuine Emerson	60¢ 60¢ 5%	Atkins' Special Steel Dexter X Cuts	# foot 70¢
Stebbin's Genuine	60¢ 10¢ 10%	Plane Irons, Butcher's	\$5.00¢ 5.25 to	Imitation	# doz \$2.00, dis 20¢ 10%	Atkins' Special Steel Diamond X Cuts	# foot 50¢
Stebbin's Tinned Ends	40¢ 10%	Plane Irons, Buck Bros	30%	Torrey's	20%	Atkins' Champion and Electric Tool X Cuts	# foot 87¢ 28¢
Chase's Hard Metal	50¢ 10%	Plane Irons, Auburn Tool Co., "This- tle"	40%	Badger's Belt and Com	# doz \$2.00	Atkins' Hollow Back X Cuts	# foot 18¢
Bush's	30%	Sandusky Tool Co.		Lamont Combination	# doz \$4.00	Atkins' Mulay, Mill	40%
Lincoln's Pattern	70¢ 70¢ 10%	Single and Cut	30%			W. M. & C. Hand	30¢ 50¢ 30¢ 10%
Weed's	20¢ 10%	Double	40%			W. M. & C. Champion X Cuts, Regu-	# foot 34¢ 20¢
Boss, # doz.		L. & I. J. White	25%			W. M. & C. X Cuts, Thin Back	# foot 27¢ 28¢
No. 1, 87; No. 2, 88; No. 3, 89; No. 4,	60¢ 10¢ 10%						
Money Drawers...	# doz, \$18¢ 20¢						
Muzzles—							
Safety	# doz, \$3.00 dis 25%						
Nails, see Trade Report.							
Wire Nails & Brads, list July 14, '87	70¢ 10%						
Wire Nails, Standard Penny...	# keg \$2.50¢ 2.60						
Nail Puller—							
Curtiss Hammer	# doz \$2, net						
Giant, No. 1	# doz, \$30.00, 10%						
Pellon	# doz, \$2.00, dis 25%						
Boss	# doz, \$30.00, dis 25%						
Lightning	# doz \$21.00						
Nail Sets—							
Square	# gr. \$4.00¢ 4.25						
Round	# gr. \$3.25						
Cannon's Diamond Point...	# gr. \$12, 20%						
Nut Crackers—							
Table (H. & B. Mfg. Co.)	40%						
Blake's Pattern	# doz \$2.00, dis 10%						
Turner & Seymour Mfg. Co.	60%						
Nuts—							
Nuts, off list Jan. 1, 1888. Square. Hex.							
Hot Pressed	5.4¢ 5.4¢						
Cold Punched	5.4¢ 5.4¢						
In lots less than 100 #, # #, add 1/4¢; 1-#	boxes, add 1¢ to list.						
Oakum—							
Government	# # 7¢ 8¢						
U. S. Navy	# # 6¢ 7¢						
Navy	# # 5¢ 6¢						
Oilers—							
Zinc and Tin	65¢ 65¢ 10%						
Brass and Copper	50¢ 10¢ 50¢ 10%						
Malleable, Hammers' Improved, No. 1	\$3.00; No. 2, \$4.00; No. 3, \$4.40						
Malleable, Hammers, Old Pattern, same	list						
Prior's Pat. or, "Paragon" Zinc	60¢ 10¢ 10%						
Prior's Pat. or "Paragon" Brass	60%						
Olmstead's Tin and Zinc	60%						
Olmstead's Brass and Copper	60%						
Broughton's Zinc	60%						
Broughton's Brass	60%						
Packing, Steam—							
Rubber							
Standard	60¢ 10¢ 60¢ 10¢ 10%						
Extra	50¢ 10¢ 60%						
N. Y. B. & C. Co., Standard	50¢ 10¢ 5%						
N. Y. B. & C. Co., Empire	70%						
N. Y. B. & C. Co., Salamander	# # 65¢, dis 30%						
Jenkins' Standard	# # 80¢, dis 35%						
Miscellaneous—							
American Packing	10¢ 11¢ # #						
Russia Packing	14¢ # #						
Italian Packing	13¢ 14¢ # #						
Cotton Packing	15¢ 17¢ # #						
Jute	7¢ 8¢ # #						
Padlocks—							
See Locks.							
Pails—							
Galvanized Iron—							
Quarts	10 12 14						
Hill's Light Weight, # doz.	\$2.75 3.00 3.25						
Hill's Heavy Weight, # doz.	5.00 5.25 5.75						
Whiting's	2.75 3.00 3.25						
Sidney Shephard & Co.	2.80 3.00 3.40						
Iron Clad	2.75 3.00 3.25						
Fire Buckets	2.75 3.25 3.50						
Buckets, see Well Buckets.							
Indurated Fibre Ware—							
Star Pails, 12 qt	# doz \$4.50						
Fire, Stable and Milk, 14 qt	# doz \$5.50						
Pencils—							
Faber's Carpenters'	high list 50%						
Faber's Round Gilt	# gro \$5.25 net						
Dixon's Lead	# gro \$4.50 net						
Dixon's Lumber	# gro \$6.75 net						
Dixon's Carpenters'	40¢ 10%						
Picks—							
Railroad or Adze Eye, 5 to 6, \$12.00; 6	to 7, \$13.00						
dis 60¢ 10¢ 60¢ 10¢ 5%							
Picture Nails—							
Brass Head, Sargent's list	50¢ 10¢ 10%						
Brass Head, Combination list	50¢ 10%						
Porcelain Head, Sargent's list	50¢ 10¢ 10%						
Porcelain Head, Combination list	40¢ 10%						
Niles' Patent	40%						
Pinking Irons—	# doz 65¢ net						
Pipe, Wrought Iron—							
List March 23, 1887.							
14 and under, Plain	55%						
14 and under, Galvanized	47%						
14 and over, Plain	65%						
14 and over, Galvanized	55%						
Boiler Tubes, Iron	60%						
Planes and Plane Irons—							
Wood Planes—							
Molding	50¢ 50¢ 50¢ 10%						
Bench, First Quality	50¢ 10¢ 60%						
Bench, Second Quality	60¢ 10¢ 60%						
Bailey's (Stanley R. & L. Co.)	40¢ 10%						
Iron Planes—							
Bailey's (Stanley R. & L. Co.)	40¢ 10%						
Miscellaneous Planes (Stanley R. & L. Co.)	20¢ 10%						
Victor Planes (Stanley R. & L. Co.)	30¢ 10%						
Steele's Iron Planes	35¢ 35¢ 5%						
Meriden Mal. Iron Co.	30¢ 10¢ 30¢ 10¢ 10%						
Davis's Iron Planes	30¢ 10¢ 30¢ 10¢ 10%						
Birmingham Plane Co.	50¢ 50%						
Gage Tool Co.'s Self-Setting	20¢ 10%						
Chaplin's Iron Planes	40¢ 40%						
Sargent's	30¢ 10¢ 30¢ 10¢ 10%						
Plane Irons—							
Plane Irons, 20¢ 10%							
Plane Irons, Butcher's	\$5.00¢ 5.25 to						
Plane Irons, Buck Bros	30%						
Plane Irons, Auburn Tool Co., "This- tle"	40%						
Sandusky Tool Co.							
Single and Cut	30%						
Double	40%						
L. & I. J. White	25%						
Pliers and Nippers—							
Button's Patent	30¢ 10¢ 40%						
Hall's No. 2, 5 in., \$18.50; No. 4, 7 in.,	\$21.00 # doz						
dis 20¢ 10¢ 33%							
Humason & Beckley Mfg. Co.	50¢ 50¢ 10%						
Gas Pliers	60%						
Gas Pliers, Custer's Nickel Plated	60¢ 5%						
Eureka Pliers and Nippers	40%						
Russell's Parallel	25%						
P. S. & W. Cast Steel	50%						
P. S. & W. Tinner's Cutting Nippers	add 5¢ dis 10%						
Carew's Pat. Wire Cutters	20%						
Morrill's Parallel, # doz	\$12.00, 30¢ 5%						
Cronk's 8 in., \$15.00; 10 in. \$21.00.	40¢ 40¢ 5%						
Plumbs and Levels—							
Regular List	70¢ 10¢ 70¢ 10¢ 10%						
Diston's	45¢ 10%						
Pocket Levels	70¢ 10¢ 70¢ 10¢ 10%						
Davis Iron Levels	30%						
Davis' Inclometers	10¢ 10%						
Peppers, Corn—							
Round or Square, 1 qt. # gr	\$12.00¢ 15.00						
Round or Square, 2 qt. # gr	\$25.00¢ 28.00						
Post Hole and Tree Augers and Diggers—							
Samson Post Hole Digger, # doz	\$36.00, dis 25¢ 10%						
Fletcher Post Hole Augers, # doz	\$36.00, dis 20%						
Eureka Diggers	# doz \$16.00¢ 17.00						
Lead's	# doz \$3.00¢ 9.00						
Vaughan's Post Hole Auger	# doz \$10.00¢ 14.00						
Kohler's Little Giant	# doz \$18.00						
Kohler's Hercules	# doz \$15.00						
Kohler's New Champion	# doz \$9.00						
Schneider	# doz \$18.00						
Ryan's Post Hole Diggers	# doz \$24.00						
Cronk's Post Bars, # doz	\$60.00, dis 50¢ 50¢ 10%						
Gibb's Post Hole Digger, # doz	\$30.00, dis 40¢ 40¢ 10%						
Potato Parers—							
White Mountain	# doz \$5.00¢ 5.50						
Antrim Combination	# doz \$8.00						
Rooster	# doz \$18.50						
Pruning Hooks and Shears—							
Diston's Combined Pruning Hook and	Saw # doz \$18.00, dis 20¢ 10%						
Diston's Pruning Hook	# doz \$12.00						
E. S. Lee & Co.'s Pruning Tools	dis 20¢ 10%						
Pruning Shears, Henry's Pat.	# doz \$3.75¢ 4.00 net						
Henry's Pruning Shears, # doz	\$4.25¢ 4.50 net						
Wheeler, M. & Co.'s Combination,	# doz \$12.00, dis 20%						
Dunlap's Saw and Chisel	# doz \$8.50, dis 30%						
J. Mallinson & Co., No. 1, \$5.25; No. 2, 7.25							
Pulleys—							
Hot House, Awning, &c.	60¢ 10%						
Japanned Screw	60¢ 10%						
Brass Screw	60¢ 10%						
Japanned Slide	60¢ 10%						
Japanned Clothes Line	60¢ 10%						
Empire Sash Pulley	65¢ 60%						
Moore's Sash, Anti-Friction	50%						
Ray Fork, Solid Eye, \$4.00; Swivel	\$4.50, dis 50¢ 10¢ 50¢ 10¢ 5%						
Ray Fork, "Anti-Friction" 5 in. Solid	\$6.70						
Ray Fork, "F" Common and Pat.	dis 50%						
Ray Fork, Tarbox Pat. Iron	30%						
Ray Fork, Reed's Self-Lubricating	60%						
Shade Rack	45%						

Machines	
Flat Head, Iron.....	55¢
Round Head, Iron.....	50¢
Bench and Hand	
Bench, Iron.....	55¢10¢55¢10¢10¢
Bench, Wood, Beech.....	70¢10¢25¢
Bench, Wood, Hickory.....	70¢10¢
Hand, Wood.....	25¢10¢25¢10¢55¢
Lag, Blunt Point.....	75¢75¢10¢
Coch and Lag, Gimlet Point.....	75¢
Bed.....	25¢55¢
Hand Rail, Sargent's.....	65¢10¢10¢
Hand Rail, H. & B. Mfg. Co.....	70¢10¢75¢
Hand Rail, Am. Screw.....	75¢
Jack Screws, Millers Falls list.....	50¢50¢55¢
Jack Screws, P. B. & W.....	35¢
Jack Screws, Sargent.....	60¢10¢80¢10¢55¢
Jack Screws, Stearns.....	40¢40¢10¢
Scroll Saws	
Lester, complete, \$10.00.....	25¢
Rogers, complete, \$4.00.....	25¢
Barnes' Builders' and Cabinet Makers'.....	15¢
Barnes' Scroll Saw Blades.....	25¢
Seythe Snaths	50¢25¢
Shears	
American (Cast) Iron.....	75¢10¢75¢10¢55¢
Pruning, See Pruning Hooks and Shears.	
Barnard's Lamp Trimmers.....	70¢
Tinners'.....	20¢25¢
Seymour's, List, Dec., 1881.....	60¢10¢10¢50¢10¢10¢55¢
Heinrich's, List, Dec., 1881.....	35¢
Heinrich's Tailor's Shears.....	35¢
First quality C. S. Trimmers.....	30¢80¢10¢
Second quality C. S. Trimmers.....	20¢
Acme Cast Shears.....	10¢10¢
Diamond Cast Shears.....	10¢
Clipper.....	10¢
Victor Cast Shears.....	75¢10¢75¢10¢55¢
Howe Bros. & Hulbert, Solid Forged Steel.....	40¢
Cleveland Machine Co., Solid Steel Forged.....	70¢
Clauss Shear Co., Japanned.....	70¢
Clauss Shear Co., Nickeled, same list.....	60¢
Sheaves	
Sliding Door.....	50¢10¢60¢25¢
R. & E., list Dec. 18, 1885.....	55¢20¢
Corbin's list.....	60¢10¢25¢
Patent Roller.....	60¢10¢25¢
Patent Roller, Hatfield's.....	70¢
Russell's Anti-Friction, list Dec. 18, 1885.....	60¢25¢
Moore's Anti-Friction.....	60¢
Sliding Shutter.....	60¢10¢25¢
R. & E. list Dec. 18, 1885.....	60¢10¢25¢
Sargent's list.....	60¢10¢
Reading list.....	60¢10¢10¢
Ship Tools	
L. & I. J. White.....	20¢55¢
Albertson Mfg. Co.....	25¢
Shees, Horse, Mule, &c.	
Horse	
Burden's, Perkins', Phoenix, at factory.....	\$4.00
Mule	
Add \$1 per keg to above prices.	
Oz. Wrought	
Ton lots.....	7¢ 9¢
1000 lb lots.....	7¢ 9¢
500 lb lots.....	7¢ 10¢
Shot	
(Eastern prices 2¢ off, cash, 5 days.)	
Drop, 7 bag, 25 lb.....	\$1.20
Drop, 7 bag, 5 lb.....	.29
Back and Chilled, 7 25-lb bag.....	1.45
Back and Chilled, 7 5-lb bag.....	.34
Shovels and Spades	
Ames' Shovels, Spades, &c., list Nov. 1, 1885.....	30¢
Norr-Jobbers frequently give 6¢ to 7¢ extra on above.	
Griffith's Black Iron.....	50¢10¢
Griffith's C. S.....	60¢10¢10¢
Griffith's Solid C. S. R. Goods.....	20¢
Old Colony (Sanford Fork & Tool Co.) 20¢	
St. Louis Shovel Co.....	20¢20¢75¢
Huesey, Binns & Co.....	15¢25¢
Hubbard & Co.....	20¢20¢75¢
Lehigh Mfg. Co.....	50¢10¢
Payne Pettibone & Son, list January, 1886.....	30¢
Remington's (Lowman's Patent).....	30¢10¢40¢
Rowland's, Black Iron.....	60¢10¢
Rowland's Steel.....	60¢25¢60¢10¢
Shovels and Tongs	
Iron Head.....	60¢10¢60¢10¢55¢
Brass Head.....	80¢10¢10¢
Skeins, Thimble	
Western list.....	75¢5¢75¢10¢
Columbus Wrt. Steel, list Nov. 1, 1887.....	20¢
Coldbrookdale Iron Co.....	50¢10¢
Utica P. S. T. Skeins.....	60¢
Utica Turned and Fitted.....	35¢
Sieves	
Buffalo Metallic, S. S. & Co.....	50¢25¢10¢
Barber Flour Sifters.....	70¢25¢
Smith's Adjustable Sifters.....	70¢25¢
Smith's Adjustable Milk Strainer.....	70¢25¢
Smith's Adjustable F. & C. Strainer.....	70¢25¢
Sieves, Wooden Rim	
Mesh 18, Nested, 70¢ 90¢	
Mesh 20, Nested, 85¢ \$1.00	
Mesh 24, Nested, 70¢ \$1.00 1.10	
Slates	
School, by case.....	50¢10¢
Snaps, Harness, &c.	
Anchor (T. & S. Mfg. Co.).....	65¢
Fitch's (Bristol).....	60¢10¢
Hotchkiss.....	10¢
Andrews.....	50¢
Sargent's Patent Guarded.....	70¢10¢10¢
Ger Etn, new list.....	40¢10¢
Cover.....	50¢25¢
Covert, New Patent.....	60¢25¢
Covert, New E. E.....	60¢25¢
Covered Spring.....	60¢10¢10¢

Soldering Irons	
Covert's Adjustable, list Jan. 1, 1886.....	35¢25¢
Spoke Shaves	
Iron.....	45¢
Wood.....	30¢
Bailey's (Stanley R. & L. Co.).....	40¢10¢
Stearns.....	20¢10¢30¢
Spoke Trimmers	
Bonney's.....	70¢10¢, dis 50¢
Ives, No. 1, \$15.00; No. 2, \$12.00 70¢10¢	
Douglas.....	70¢10¢, dis 20¢
Spoons and Forks	
Tinned Iron	
Basting, Cen. Stamp. Co.'s list.....	70¢10¢
Solid Table and Tea, Cen. Stamp. Co.'s list.....	70¢10¢
Buffalo S. S. & Co.....	35¢25¢
Silver-Plated (4 mos. or 5¢ cash 30 days)	
Meriden Brit. Co., Rogers.....	50¢
C. Rogers & Bros.....	50¢
Rogers & Bro.....	50¢
Reed & Barton.....	50¢10¢25¢
Wm. Rogers Mfg. Co.....	50¢10¢
Simpson, Hall, Miller & Co.....	50¢10¢
Holmes & Edwards Silver Co.....	50¢10¢
H. & E. Silver Co., Mexican Silver.....	50¢25¢
H. & E. Silver Co., Durham Silver.....	50¢25¢
German Silver.....	50¢25¢
Nickel Silver.....	50¢25¢
Britannia.....	60¢
Boardman's Flat Ware.....	50¢10¢
Boardman's Nickel Silver.....	50¢
Boardman's Britannia Spoons, case lots.....	60¢
Springs	
Elliptic, Concord, Platform and Half Scroll.....	60¢60¢25¢
Cliff's Bolster Springs.....	25¢
Squares	
Steel and Iron.....	75¢10¢80¢
Nickel-Plated.....	75¢10¢80¢
Try Square and T Bevels.....	60¢10¢10¢70¢
Diston's Try Square and T Bevels.....	45¢10¢
Winterbottom's Try and Miter.....	30¢10¢
Starrett's Micrometer Calliper Squares.....	25¢
Avery's Flush Bevel Squares.....	30¢25¢
Staples	
Fence Staples, Galvanized.....	Same price as B'rb Wire.
Fence Staples, Plain.....	See Trl. Rep.
Steelyards	40¢10¢50¢
Stocks and Dies	
Blacksmith's Waterford Goods.....	30¢
Blacksmith's Butterfield's Goods.....	50¢30¢10¢
Lightning Screw Plate.....	25¢30¢
Reece's New Screw Plates.....	33¢25¢40¢
Stone	
Hindustan No. 1, 3¢; Axe, 8¢; Slips No. 4, 4¢	
Sand Stone.....	7¢ 2¢
Washita Stone, Extra.....	7¢ 19¢20¢
Washita Stone, No. 1.....	7¢ 14¢15¢
Washita Stone, No. 2.....	7¢ 10¢11¢
Washita Slips, No. 1, Extra.....	7¢ 30¢35¢
Washita Slips, No. 1.....	7¢ 24¢25¢
Arkansas Stone, No. 1, 4 to 6 in.....	7¢ \$1.00
Arkansas Stone, No. 1, 6 to 9 in.....	7¢ \$1.85
Turkey Oil Stone, 4 to 8 in.....	7¢ \$1.00
Turkey Slips.....	7¢ \$1.00
Lake Superior, Chase.....	7¢ 15¢
Lake Superior Slips, Chase.....	7¢ 31¢32¢
Seneca Stone, Red Paper Brand.....	7¢ 18¢20¢
Seneca Stone, High Rounds.....	7¢ 20¢25¢
Seneca Stone, Small Whets.....	7¢ \$2.00
Stone Polish	
Joseph Dixon s.....	7¢ \$3.00, dis 10¢
Gold Medal.....	7¢ \$3.00, dis 25¢
"Mirror".....	7¢ \$3.00, dis 25¢
Lustro.....	7¢ \$4.75 net
Ruby.....	7¢ \$3.75 net
Rising Sun, 5 gro lots.....	7¢ \$5.50
Dixon's Plumbago.....	7¢ \$8 net
Boydton's Noon Day.....	7¢ \$1.00
Parlor Fringe Stove Enamel.....	7¢ \$13.00
Yates Liquid, 2 3 5 10 gal. cans.....	7¢ \$0.90 .80 .70 .50
Yates Standard Paste Polish, 10-b cans.....	7¢ 15¢
Jet Black.....	7¢ \$3.50
Japanese.....	7¢ \$3.50
Diamond O. K. Enamel.....	7¢ \$1.00
Bonnett's Liquid Stove Polish.....	7¢ \$9.00
Bonnett's Paste Stove Polish.....	7¢ \$6.00
Black Eagle Benzine Paste, 5 and 10 lb cans.....	7¢ 12¢
Black Jack Water Paste, 5 and 10 lb cans.....	7¢ 12¢
Nickel Plate Paste.....	7¢ \$3.00
Tacks, Brads, &c.	
List, Jan. 2, 1888. (Note.—Some manufacturers are selling Tacks at slightly higher prices than those named):	
American Iron Carpet.....	80¢80¢55¢
Swedes Iron Carpet.....	80¢80¢55¢
American Iron Cut.....	75¢75¢10¢
Swedes Iron.....	75¢75¢10¢
Swedes Iron, Upholsterers.....	75¢10¢75¢10¢55¢
Tinned Swedes Iron.....	75¢10¢75¢10¢55¢
Tinned Swedes Iron, Upholsterers.....	75¢10¢75¢10¢55¢
Gimp and Lace.....	75¢10¢75¢10¢55¢
Tinned Gimp and Lace.....	75¢10¢75¢10¢55¢
Swedes Iron Trimmers.....	75¢10¢75¢10¢55¢
Swedes Iron Miners.....	75¢10¢75¢10¢55¢
Swedes Iron Bill Posters or Railroad.....	75¢10¢75¢10¢55¢
Swedes Steel (Swedes Iron price list).....	80¢80¢55¢
Copper Tacks.....	50¢10¢
Copper Finishing, Trunk and Clout Nails.....	50¢10¢
Finishing Nails.....	70¢10¢70¢10¢10¢
Trunk and Clout Nails.....	70¢10¢70¢10¢10¢
Tinned Trunk and Clout Nails.....	70¢10¢70¢10¢10¢
Basket Nails.....	70¢10¢70¢10¢10¢

Common and Patent Brads	70¢10¢70¢
Hungarian Nails.....	10¢10¢
Chair Nails.....	70¢10¢70¢10¢10¢
Zinc Glaziers' Points.....	50¢50¢25¢
Cigar Box Nails.....	50¢10¢50¢10¢25¢
Picture-Frame Points.....	50¢10¢50¢10¢25¢
Looking-Glass Tacks.....	50¢10¢50¢10¢25¢
Leathered Carpet.....	50¢10¢50¢10¢25¢
Brush Tacks.....	50¢10¢50¢10¢25¢
Shoe Finders, list Jan. 2, 1888.....	10¢10¢
Lining and Saddle Nails , list Jan. 1, 1886.....	10¢10¢55¢
Silvered.....	30¢10¢10¢
Japanned.....	30¢10¢10¢
Double-Pointed Tacks.....	30¢10¢10¢
Wire Carpet Nails.....	50¢10¢
Wire Brads and Nails, see Nails, Wire.....	50¢10¢
Steel-Wire Brads, K. & E. Mfg. Co.'s list.....	50¢10¢
Tap Borers	
Common and Rind.....	20¢10¢
Ive's Tap Borers.....	35¢25¢
Enterprise Mfg. Co.....	30¢10¢30¢
Clark's.....	35¢25¢
Tapes, Measuring	
American.....	25¢10¢
Spring.....	40¢
Chesterman's, Regular list.....	25¢30¢
Thermometers	
Tin Case.....	80¢80¢10¢
Thimble Skeins —See Skeins.	
Ties, Bale—Steel	
Standard Wire, list.....	50¢10¢25¢
Tinners' Shears, &c.	
Shears and Snips (P. S. & W.).....	20¢25¢
Funches & Funches.....	35¢
Snips, J. Mallinson & Co.....	35¢
Tinware	
Stamped, Japanned and Piced, list Jan. 20, 1887.....	75¢75¢55¢
Tire Benders, Upsetters, &c.	
Stoddard's Lightning Tire Upsetters.....	15¢
Detroit Perfected Tire Bender.....	15¢
Tobacco Cutters	
Champion.....	20¢10¢30¢
Wood Bottom.....	70¢50¢25¢
All Iron.....	70¢50¢25¢
Nashua Lock Co.'s.....	70¢50¢25¢
Wilson's.....	70¢50¢25¢
Sargent's.....	70¢50¢25¢
Acme.....	70¢50¢25¢
Transom Lifters	
Wollensak's Class 3 and 4, Bronzed Iron.....	50¢
Class 3 and 4, Bronze Metal.....	25¢
Class 3 and 4, Brass.....	25¢
Shiglig Lifters.....	30¢
Crown, Eagle and Shield.....	50¢
Reither's Bronzed Iron Rods, list Jan. 1, 1887.....	50¢25¢
Reither's Real Bronze or Nickel Plate.....	50¢25¢
Excelsior.....	50¢10¢25¢
Shaw's.....	50¢10¢
Payson's Universal.....	40¢40¢10¢
Traps	
Game	
Newhouse.....	75¢40¢55¢
Onida Patent.....	30¢70¢25¢
Game, Blake's Patent.....	40¢10¢55¢
Mouse and Rat	
Mouse Wood Choker.....	70¢10¢12¢
Mouse, Round Wire.....	70¢10¢12¢
Mouse, Cage Wire.....	70¢10¢12¢
Mouse, Catch-em-alive.....	70¢10¢12¢
Mouse, Panama.....	70¢10¢12¢
Mouse Delusion.....	70¢10¢12¢
Rat, "Decoy".....	70¢10¢12¢
Ideal.....	70¢10¢12¢
Cyclone.....	70¢10¢12¢
Hotchkiss Metallic Mouse, 5-hole traps.....	70¢10¢12¢
In full cases.....	70¢10¢12¢
Trowels	
Lothrop's Brick and Plastering.....	25¢
Reed's Brick and Plastering.....	15¢
Disston's Brk and Plastering.....	25¢25¢10¢
Peace's Plastering.....	25¢
Clement & Hayward's.....	20¢
Rose's Brick.....	15¢20¢
Brade's Brick.....	25¢
Worrall's Brick and Plastering.....	20¢
Garden.....	70¢
Triers	
Butter and cheese.....	25¢
Tracks, Warehouse, &c.	
B. & L. Block Co.'s list.....	82¢
Tubes, Boiler	
See Pipe.	
Twine	
Flax Twine	BC. B.
No. 9, 4 and 1/2 lb Balls.....	22¢ 30¢
No. 12, 4 and 1/2 lb Balls.....	21¢ 25¢
No. 18, 4 and 1/2 lb Balls.....	21¢ 25¢
No. 24, 4 and 1/2 lb Balls.....	18¢ 28¢
No. 36, 4 and 1/2 lb Balls.....	16¢ 27¢
No. 24, Mattress, 1/2 and 1/2 lb Balls.....	48¢ 50¢
Chalk Line, Cotton, 1/2 lb Balls.....	25¢
Mason Line, Linen, 1/2 lb Balls.....	55¢
2-Ply Hemp, 1/2 and 1/2 lb Balls (Spring twine).....	12¢12¢
3-Ply Hemp, 1/2 and 1/2 lb Balls.....	11¢11¢
Cotton Wrapping, 5 Balls to lb.....	15¢16¢
2, 3, 4 and 5-Ply Jute, 1/2 lb Balls.....	10¢
Wool.....	6¢10¢14¢
Paper.....	13¢14¢
Cotton Mops, 6, 9, 12 and 15 lb to doz.....	18¢
Vines	
Solid Box.....	60¢60¢55¢
Pushed.....	60¢60¢55¢
Fisher & Norris Double Screw.....	15¢10¢
Stephens.....	25¢30¢

Parker's	30¢25¢
Wilson's.....	55¢
Howard's.....	40¢
Bonney's.....	40¢10¢
Millers Falls.....	40¢40¢10¢
Trenton.....	40¢40¢10¢
Merrill's.....	15¢20¢
Sargent's.....	60¢10¢10¢
Beckus and Union.....	40¢
Double Screw Leg.....	15¢10¢
Prentiss.....	30¢25¢
Simpson's Adjustable.....	40¢
Saw Files	
Bonney's, Nos. 2 & 3, \$15.00.....	dis 40¢10¢
Stearns.....	35¢40¢10¢35¢10¢10¢
Stearns' Silent Saw Files.....	35¢40¢25¢
Sargent's.....	60¢40¢10¢
Hopkins.....	70¢17¢50¢, dis 10¢
Reading.....	20¢10¢
Wentworth.....	30¢42¢00
Combination Hand Vices.....	70¢
Cowell Hand Vices.....	30¢
Bauer's Pipe Vices.....	10¢
Wagon Boxes	
Per B.....	34¢
Wagon Jacks	
Daisy.....	70¢25¢
Washer Cutters	
Smith's Pat. 70¢12¢, dis 20¢10¢10¢	
Johnson's.....	70¢11¢, dis 35¢15¢
Penny's.....	70¢11¢, dis 35¢15¢
Jap'd, \$16.00, dis 55¢	
Appleton's.....	70¢11¢, dis 55¢
Bonney's.....	30¢10¢
Washers	
Size.....	1/2 5-16 3/8 1/2 5/8 3/4 1
Washers.....	7 5 4 4 8 8 4 8 4 8 4
In lots less than 200 lb, 7¢ lb, add 1/4¢, 5-b boxes 1¢ to list.	
Wedges	
Iron.....	70¢ 34¢
Steel.....	70¢ 34¢
Well Buckets, Galvanized	
Hill's.....	70¢ doz, 12 qt, \$4.25; 14 qt, \$5.35
Iron Clad.....	70¢ doz, 14 qt, \$4.25; 14 qt, \$5.35
Whiting's Flat Iron Band.....	\$4.25; 14 qt, \$5.35
Whiting's Wired Top.....	70¢ doz, \$4.00; 14 qt, \$5.35
Well Wheels	
8 in., \$2.25; 10 in., \$2.70; 12 in., \$3.35.	
Wire	
Iron	
Market, Br. & Ann., Nos. 0 to 18.....	70¢10¢75¢
Market, Cop'd, Nos. 0 to 18.....	70¢70¢25¢
Market, Galv., Nos. 0 to 18.....	65¢25¢
Market, Tin'd, Tinned list Nos. 0 to 18.....	67¢45¢
Stone, Br. and Ann'd, Nos. 16 to 18.....	72¢45¢75¢25¢
Stone, Bright and Ann'd, Nos. 16 to 18.....	75¢75¢55¢
Stone, Br. and Ann'd, Nos. 27 to 30.....	75¢10¢55¢
Stone, Tinned.....	70¢70¢10¢

THE IRON AGE

THURSDAY, JANUARY 31, 1889.

The Buchanan Magnetic Rolls.

In a paper descriptive of a number of iron ore concentrating plants and machinery published in the *Journal* of the United States Association of Charcoal Ironmakers, John Birkinbine, the editor, furnishes the following data relating to the Buchanan magnetic rolls:

More thorough and systematic work has been done with this machine than on any other. The Edison machine has treated a larger number of ores than any other and

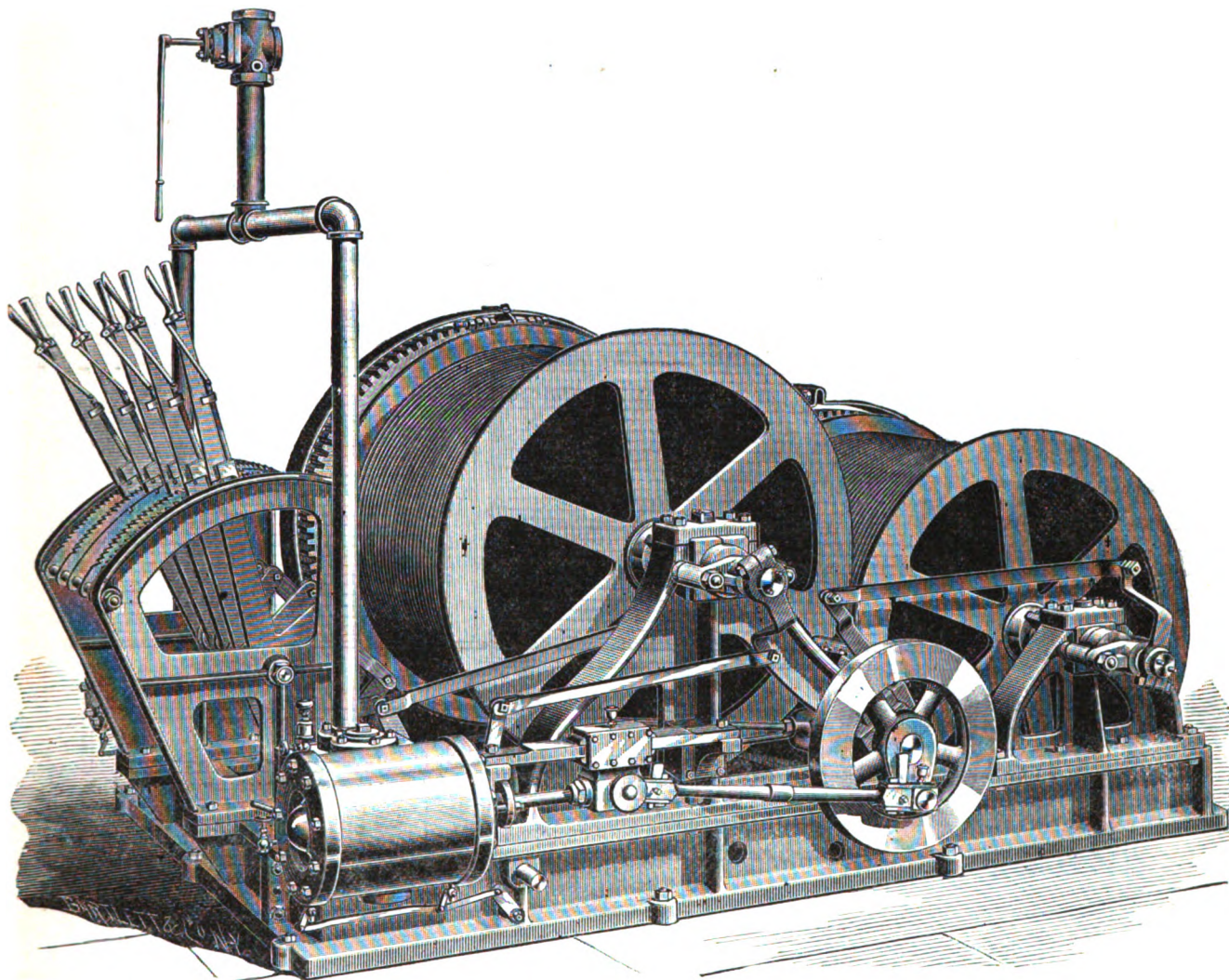
around the magnetic portion, adhering until it passes beyond the magnetic influence, while the non-magnetic particles drop between the rolls.

The Messrs. Cheever have been experimenting with these magnetic rolls to determine the commercial problem of treating the dump-pile which represents the lean material left after sorting out the merchantable ore taken from their impressive tunnel in the Croton hills. In connection with these experiments the Messrs. Cheever have established a chemi-

than to notice the merits of the appliances used. It will be noted in the analyses given above that the sulphur increased in the concentrates of Croton ore, owing to the fact that it passed over with the magnetite.

Hoisting Engine.

Hoisting and conveying material by means of a suspended wire cable has been so widely adopted as to call for machinery more or less particularly adapted for the service. The hoisting engine here



HOISTING ENGINE, BUILT BY THE LIDGERWOOD MFG. COMPANY, NEW YORK.

shown its capabilities under varying conditions, and the Wenström machine has also been operated on several ores. The Buchanan rolls, on the other hand, have been operated practically on one ore—viz., that obtained from the Croton mines in New York. The crushing plant at these mines has been utilized by the Messrs. Cheever to reduce ore from the extensive waste pile at the Croton mines to about 15-mesh size, and this has been passed through the Buchanan magnetic rolls. These consist of iron rolls revolving on journals which are carried on insulated standards wound with copper wire. By connecting these wires with a battery the standards become electro-magnetic of opposite polarity and the rolls are charged thereby, making a magnetic field between the rolls. The ore being fed on the rolls, which revolve toward each other, is carried

cal laboratory, and the following determinations are selected from a larger number of analyses made by Mr. Edwin K. Landis, chemist:

Separation of Croton (Theall) Ore by Buchanan Magnetic Rolls.

	Crude ore.	Concentrates.	Tailings.
Iron.....	37.968	64.594	13.207
Silica.....	29.30	5.350	50.20
Phosphorus....	0.383	0.050	0.492
Sulphur.....	0.522	1.253	0.924
Iron.....	81.28	62.56	4.66
Silica.....	35.50	6.825	58.05
Phosphorus....	0.271	0.058	0.527
Sulphur.....	0.784	1.320	0.945

The analyses given in this article are not necessarily comparative as applied to the various machines used, for with each machine the conditions are different, and the determinations are given to show the possibilities of magnetic separation rather

illustrated was designed to meet the requirements of this character. Both drums are loosely mounted and are entirely independent of each other in operation. They may be thrown in and out of gear with the engines in motion, either separately or together, or one drum may be employed in lowering while the other is hoisting; or both drums may be thrown into gear and the engine used as a regular reversible engine, one load being hoisted while the empty cage is being lowered. This independent construction permits of one drum being thrown into gear to wind up the main rope, while the other drum, being out of gear and loose on the shaft, pays out the tail-rope. Reversing the engines, of course, reverses their operations. The drums are made in one casting, turned off true and spirally grooved for the rope. The friction is of the double-cone type and

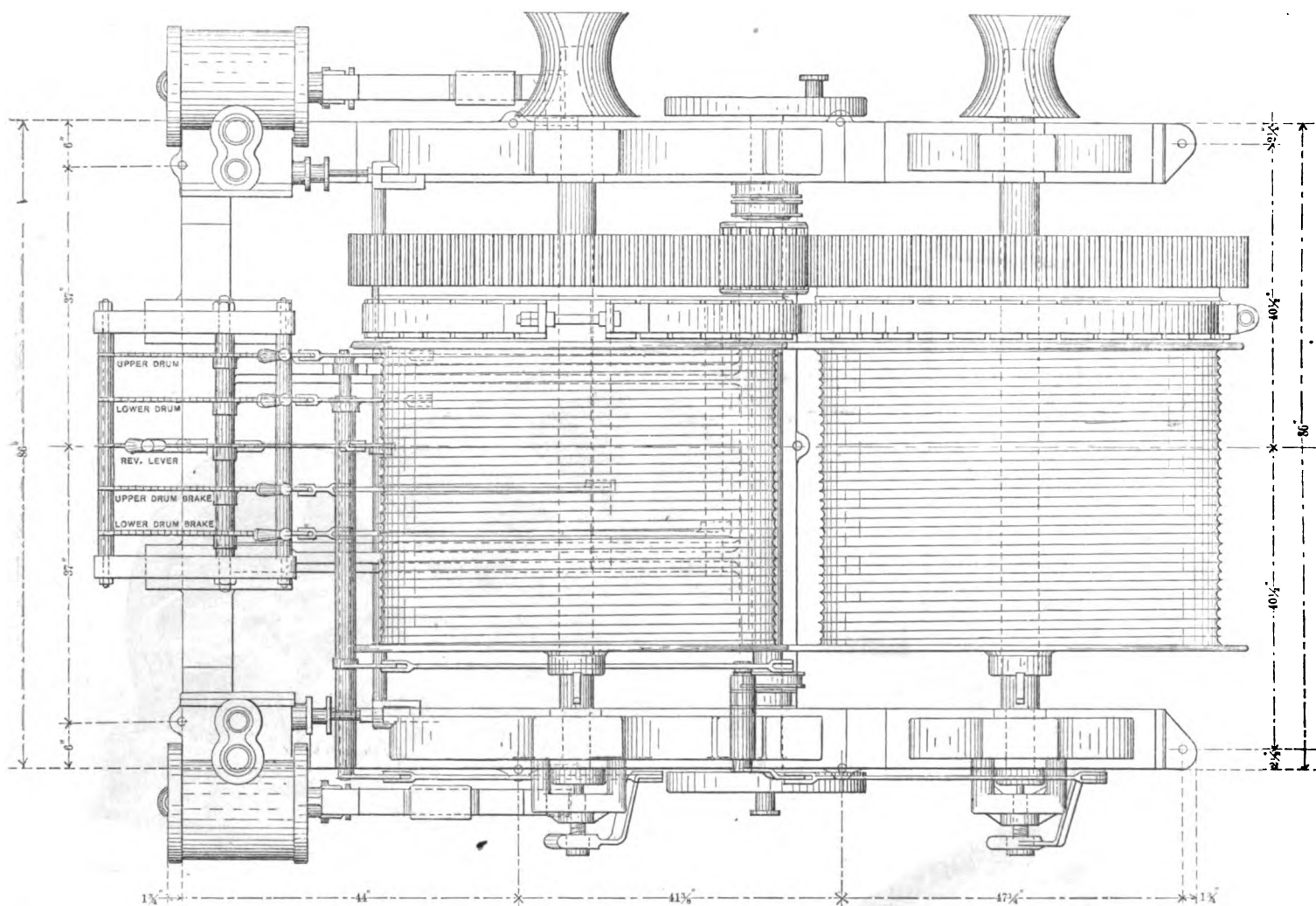
is composed of segments of hard wood, bolted fast to spur-wheels and turned off conically to suit the flanges of the drum with which it engages. A very small movement of the drum along the shaft is sufficient to engage it with the friction surface. This is accomplished by means of a powerful lever, screw and nut at the end of the drum shaft, attached to the side stand, and communicating motion to the drum by means of a steel pin, cross-key and collar. The friction is such that a comparatively light pressure on the lever is sufficient to hold the drum firmly in gear against any load the engine can hoist. When the pressure is removed the drum is released by a spiral spring on the shaft between the drum and gear-wheel. The

ingots is considerably behindhand. The *Engineer* reports that Bell Bros. do not intend to adopt the usual cogging mill and hot slab shears for reducing their ingots into blooms of marketable size and shape. They are adopting the hydraulic squeezer system, which has been so successful in making forgings at Manchester, Sheffield and elsewhere. Blooms will be made for the general market, and it is expected they will be purchased by many of the owners of ironworks who do not care to put down a steel melting plant themselves. The situation of the Port Clarence works is exceedingly good for carrying on a trade of this kind. Blooms can be sent thence to any consumer's works situated on the seaboard on the Northeast Coast, in full

tends along the line for instant communication with headquarters in case of accidents or break-downs. The machinery started off very well, and the new line promises to work very satisfactorily.

Butterworth on the Despotism of Labor.

The alleged "Despotism of Labor" was the occasion of a vigorous philippic by Representative Butterworth, of Ohio, last week, the special provocation being an attempt to banish steam printing presses from the Bureau of Engraving and Printing at the instigation of hand plate printers. He wished to go on record as oppos-



Plan.

HOISTING ENGINE, BUILT BY THE LIDGERWOOD MFG. COMPANY, NEW YORK.

brake is a broad iron band, lined with blocks of hard wood, which encircles the flange of the drum. The gearing is the usual spur-wheel and pinion type. The engines are similar to those which are so well known in connection with hoisting machinery of this make. All movements of the hoisting engine are controlled by five levers placed side by side, as shown in the perspective and plan views; the throttle is also within convenient reach of the operator. These engines are made by the Lidgerwood Mfg. Company, of 96 Liberty street, New York.

The new steel works erected at Port Clarence, England, by Bell Bros., of whom I. Lowthian Bell is a member, are ready to commence operations so far as to make ingots; and, indeed, a trial cast has already been made. But, as in the other case, the machinery for dealing with the

craft-loads, for about 2/ per ton. The process adopted by Messrs. Bell Bros. is that known as the "neutral" process, the hearth of the furnace being lined with chrome ore, or other material which is neither distinctly acid nor basic. M. Pourcel, formerly of the Terre Noire Works, in France, occupies the position of responsible adviser to the firm on technical matters connected with the steel melting plant.

A new cable street railway was formally opened for business in Chicago on the 22d inst. It is the Lincoln avenue branch of the North Chicago Street Railway and is about a mile and a half in length, extending a short distance beyond the city limits. The power plant consists of eight boilers of 750 horse-power and two steam engines built by Robert Wetherill & Co., of Chester, Pa. A complete electrical apparatus ex-

ing any change in the presses at the behest or dictation of any combination or society or collection of individuals. Mr. Butterworth said that he approved of the combination of labor, but he did not approve of force being used to exclude any American from any walk of life or any calling. It was needless for members to shut their eyes to the fact that some of these organizations had starved widows and orphans into compliance with their behests. While he in no way objected to organizations in the interests of men, wherever and however employed, he protested against the utilization of those organizations for the purpose of compelling obedience to their high behests except by argument and the influence of moral suasion. All he insisted upon was that members should stand by their deliberate judgment and not yield to the suggestion that it would shorten their political life not to do so. He denied the

right of any association to say to his boy that he should not learn the trade of his father. Against that right he inveighed. "If this House had done its duty," said the speaker, "the children of men who made and kept the republic would not be crowded out of work by the shiploads of lazzaroni from Europe who landed daily on our shores." In brief, Mr. Butterworth's speech was a protest against the bulldozing of trades unions and a contention that every man has a right to the management of his own affairs.

The St. Mary's Canal.

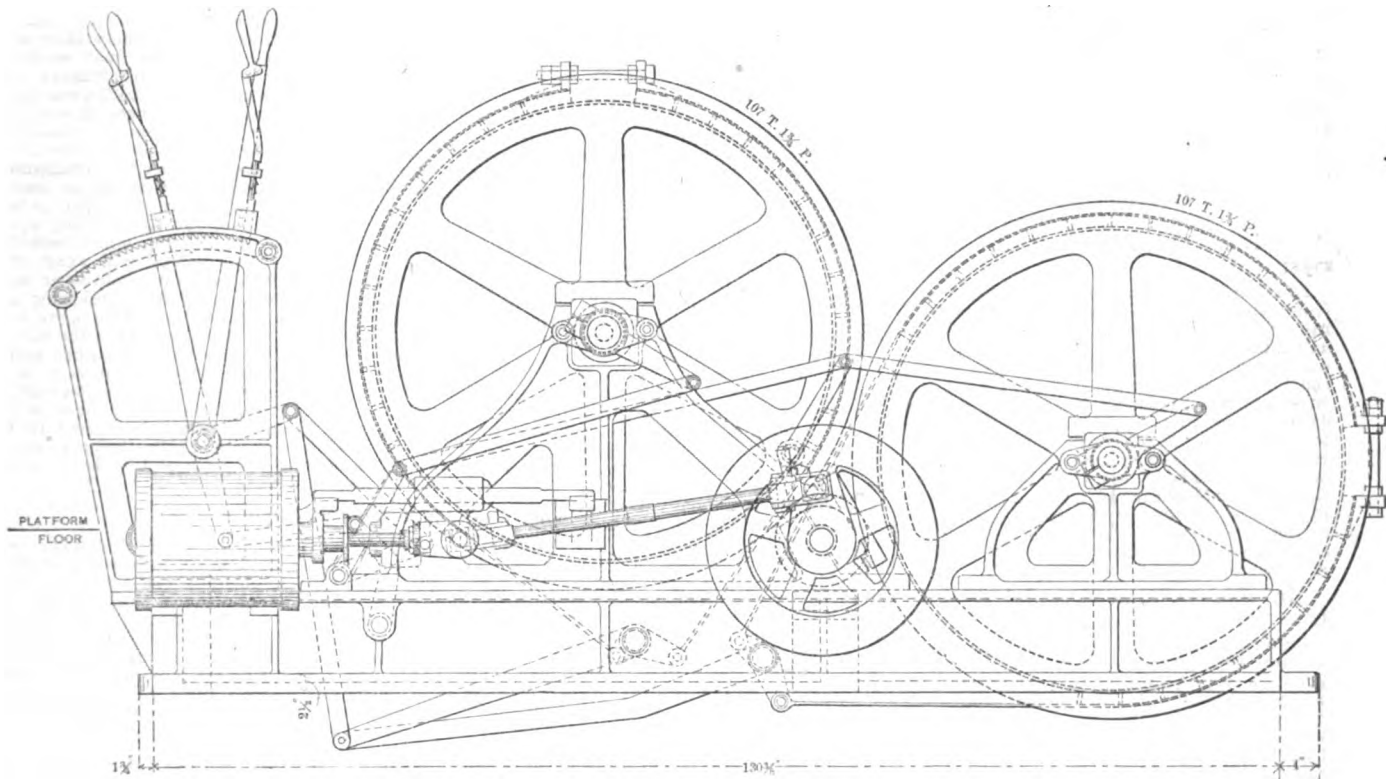
The report of Col. O. M. Poe to the Chief of Engineers, on the commerce of the St. Mary's Falls Canal, Michigan, for the last navigation season, gives fresh illustration of the magnitude of the commerce which comes through the great

cargo of registered vessels in 1888 was 876.6 tons, as against 644 tons in 1887, an increase of 36 per cent.

As to the quantity and value of the respective kinds of freight carried through the canal in 1888, as compared with 1887, Colonel Poe's report gives the following figures: Coal 2,105,041 tons, an increase of 56 per cent., valued at \$7,367,643; flour, 2,190,725 barrels, an increase of 39 per cent., valued at \$10,953,625; wheat, 18,596,351 bushels, a decrease of 19 per cent., valued at \$18,224,428; grain other than wheat, 2,022,308 bushels, an increase of 161 per cent., valued at \$1,981,861; manufactured iron, 48,859 tons, a decrease of 20 per cent., valued at \$2,442,950; pig iron, 14,844 tons, an increase of 5 per cent., valued at \$252,348; salt, 210,433 barrels, an increase of 3 per cent., valued at \$210,433; copper, 28,960 tons, a decrease of 17 per cent., valued at \$5,792,000; iron ore, 2,570,-

vides all that is necessary to render the Government absolutely independent of the world in the matter of building and equipping a navy. There is ample competition among bidders for the construction of engines and machinery, and in this matter American enterprise and ingenuity seem likely to lead the world.

American Patents on Foreign Inventions.—An important decision affecting the life of an American patent has been reached by the United States Supreme Court in the case of the Rate Refrigerating Company, applicant, against George B. Hammond & Co. By the statute of the United States it is provided that when a patent is taken out in a foreign country, and one subsequently is taken out in this country, the patent shall expire in the United States with the expiration of the patent in the foreign country in which it first runs out. Under



Side Elevation.

HOISTING ENGINE, BUILT BY THE LIDGERWOOD MFG. COMPANY, NEW YORK.

lakes. It was valued last season at \$82,156,019, or \$28,000,000 more than in 1885, \$13,000,000 more than in 1886, and \$3,000,000 more than in 1887. The failure to keep up the proportionate increase in 1888 is attributed to the short crop of merchantable wheat, the diminished demand for railroad iron in the Northwest, a restricted output from the Lake Superior mines and shipments of iron by rail. It is assumed that these causes are only temporary and that the percentage of increase will probably be restored next season. As compared with the season of 1887, there was an increase in the registered tonnage of 283,061, or 5 per cent., and in the freight tonnage of 916,776, or 17 per cent. The total freight tonnage was 6,411,423 tons. It is noteworthy, however, that while both the registered and freight tonnage increased, the number of vessels passing through the canal was less by 1552, or a decrease of 17 per cent. The average tonnage of registered vessels in 1887 was 574.2, but in 1888 it was 703, an increase of 22.4 per cent., although the number of registered vessels in 1888 was 216 less. The average

1517 tons, an increase of 3 per cent., valued at \$8,996,809; lumber, 240,372,000 feet, an increase of 45 per cent., valued at \$4,326,696; silver ore, 3385 tons, an increase of 867 per cent., valued at \$520,579; building stones, 33,541 tons, an increase of 150 per cent., valued at \$335,410; and unclassified freight, 345,854 tons, valued at \$20,751,240, or about 5 per cent. of the total freight tonnage.

The condition and prospects of the United States Navy are referred to by the House Committee on Naval Affairs, which quotes the Appropriation Committee as saying that the appropriation of \$625,000 for extending the gun plant at the Washington Navy Yard will be all that is necessary to put three different navy yards in condition to build the hulls of the finest modern vessels, armored and unarmored, as well as for the equipment of a great plant for the assembly of heavy ordnance. Satisfactory progress is being made by the private contractors for supplying heavy gun and armor plate forgings and for rapid-fire machine guns. The bill reported pro-

the Canadian law patents are granted for five years, with the privilege of renewal for two periods of five years each. The question in this case was whether the lifetime of the American patent expired five years from its issuance in Canada or at the end of 15 years, which is the limit to which the life of a patent may be extended in Canada. The Supreme Court holds that the lifetime of an American patent first taken out in a foreign country does not expire until the extreme limit of time for which an extension of patent may be secured in the foreign country. The decision of the Circuit Court of Massachusetts is thus reversed.

Several of the big buildings of Philadelphia have recently had placed in them scales with a hopper receptacle for holding several tons of coal. They are situated under the sidewalk shutters, and the coal is dumped directly into the hopper from the cart and then weighed. The engineer of one of these buildings says that thus assuring full weight in the coal he buys he saves the value of the scale many times during the year.

HUNT'S RAIL SPECIFICATIONS.

The Views of Railroad Men.

We print below the opinions expressed by railroad managers and engineers on the subject brought up by the paper of Captain W. R. Hunt in the columns of the *Railroad Gazette*. One chief engineer of a trunk line writes:

Instead of tests made by the company, we accept a guarantee for a number of years from the manufacturers, which is evidently the simplest way of getting good rails, and no corporation can nowadays exact both. In other words, we must either tell the manufacturers how to make the rail and then stand by the result, or leave it to him and accept his guarantee. Under our contracts we have the right to examine the results of analyses made at the shop, and we see to it that the rail is properly rolled to the standard section, is straight and without flaws.

Mr. Katté concurs generally with Mr. Hunt's views, as given in the paper quoted from. Mr. W. H. Brown, of the Pennsylvania, says: "From our observation and experience we find that the rails now furnished this company improve in the wearing quality and strength. We have very little or no trouble of late years from broken rails, since we keep the amount of carbon within the limits of 0.30 to 0.50 per cent. of the company." Mr. J. T. Richards, Asst. Chief Engineer of the Pennsylvania, speaking of the specifications, says:

These have been formulated gradually and from experience in the wear and breakage of rail, gathered through a long series of years, and if they are not perfect they are the best we can put forth at this time. As you know, there is a great difference of opinion among engineers and managers of railroads on this subject, and, in my opinion, it is right that there should be, as the traffic and also the extremes of temperature are so widely different on the railroads of the United States, even though they be not many miles apart; hence it would be manifestly impossible to establish an absolute rule as to the chemical and physical characteristics of rails to which all the railroads could conform.

Mr. Jas. O. Osgood, Chief Engineer Lake Shore and Michigan Southern, says:

I am not prepared to state just what chemical tests I should recommend, but in my opinion it is very desirable that chemical tests should be made which will secure uniformity of material and regulate the amount of carbon and phosphorus. Rails as ordinarily furnished I have generally found too soft to wear well, and I believe, with proper care in regard to the chemical constituents, that a hard rail can be obtained which will be much more serviceable than the ordinary product of the mills, and which will not be subject to much breakage. In addition to any chemical tests which may be required, much more than ordinary care should be taken in straightening rails and in inspection for surface defects. No doubt physical tests of the material should be had also. I consider the present practice of rail inspection entirely inadequate to secure proper results.

Mr. J. D. Hawks, Chief Engineer Michigan Central, who is known as a careful observer and student of rail wear, writes:

I am entirely at sea in regard to proper specification for steel rails. I am satisfied in my own mind that the difficulties we have had of late years from soft rails are largely owing to mechanical construction. I cannot learn that any less pains are taken with the quality of material than formerly, and never yet have seen a soft rail myself with a thin head, our trouble in that direction having been entirely with the 65-pound rail, which has a head out of all proportion to the size of the rest of the rail. The head is so large that in order to get the rail through the rolls before the neck and flanges get too cold for rolling, the head has to be kept at altogether too high a heat to produce satisfactory results. Our new 80-pound rail* is designed to obviate this difficulty. If it is not a success in this direction, then the rolling mills have got to get up some other excuse for making poor rails. I think the Michigan Central has met

every excuse, except this latter one of the large head, that the steel men have offered. We have shown them that their rails are laid on a good road-bed with an abundance of ties and good joint fastenings, and have also shown them that the excuse they make of heavier and faster traffic is no excuse at all on our road, as we run the heavy and fast traffic over some of our old 60-pound rails with the same conditions as to road-bed. The soft rail that I have had trouble with has always been very coarse grain. A piece taken out of the head, or even the entire head, and forged down under a steam hammer, will show fine grain. There have been, of course, a great many suggestions offered as to manner of inspecting rails. We try to have our rails carefully inspected for flaws, splits at the ends and crooked or lumpy surfaces and lines. The physical tests have not so far amounted to much, and I am at sea as to what really constitutes a proper physical test, especially in view of the fact that where I have undertaken to specify certain physical qualities that the rail should possess, the rolling mill has refused to sign the contract. It is true that it has been my misfortune to undertake to insert these qualifications in the contract on a rising market. If I could catch the market on the drop after the rail contract was as good as closed I might be more successful. I have, of course, great hopes that our new 80-pound section will give us much better results than the 65-pound section. The mill people have only of late years complained about the 65-pound section being too large in the head. This theory of the large head was perhaps good enough at the time the large head was first adopted. I inclose sketch showing how the large head came to be adopted on the L. S. and M. S. You will notice that the section of 60-pound rail is, in the light of the present experience, a very good one. The same distance between flange and head was maintained on the 65-pound rail, and the five pounds were added to the head, except a very small bit on the extreme end of the flange. The rolling-mill people did not object to this at the time, and since then, on many roads, the idea has been carried still further by adding more weight to the head in a 70 and 75-pound rail.

While the theory of this addition to the head is that after $\frac{1}{4}$ or $\frac{1}{2}$ inch of the material is worn off the head there will still remain as good a section as the original lighter section, practice shows altogether a different state of affairs. The 60-pound rail that we still have in track has a thin and light head. It has been subjected to very heavy traffic for 15 or 16 years, and will not show $\frac{1}{4}$ inch worn off the head during all that time. If the 80-pound rail will give us as good service as this old 60-pound it is all that I ask. I do not expect any better service, but shall be very well satisfied with rail that will last under our traffic for 15 years. We certainly have not had anything of the kind since we have adopted a 65-pound section, either of American or English make. The 80-pound rail will be laid with a very much improved joint fastening as compared with the short four-hole splice of the 60-pound rail, and should give better results on that account. In fact, much of the 60-pound rail was laid originally with chairs with only a two-hole splice. It stood this kind of a joint very well, and because it did stand with a chair for an anvil, it shows to me that the railmen are paying altogether too much attention to the style of joint that should be used. The joint being outside of their contract, they have found it convenient to lay a good share of our trouble from soft rail to poor joints and joint fastenings.

Mr. Robert Sayre, second vice-president Lehigh Valley, is another engineer who has given especial attention to rails. He writes:

I have never prepared a specification for the test of rails, for the reason that we obtain almost all our rails from the Bethlehem Iron Company and depend upon it furnishing us with a good rail, and as we are near the mill we can return any failures. The only specification I have is with regard to the carbon. I have raised this from 0.40 to from 0.50 to 0.55, and am considering the propriety of limiting it to 0.60. I believe this right. As we use a heavier rail I think we can use a higher carbon and get better results.

The chief engineer of an Eastern line carrying a very heavy and fast traffic writes:

This company has been trusting the mills that roll the rails, and I do not think they are up to the proper standard. They are considerably inferior to English rails—at least those made some 15 or 20 years ago. We have taken out of this company's main line this summer John Brown rails that have been in the track since 1868, 60 pounds per yard, and they were not so much worn but that they will be good for a number of years yet. I have doubts if our new rails, which have only been in the track a short time, will last 15 years, especially those put in on the main line.

Col. H. S. Haines, general manager of the "Plant" lines, writes:

I have the disposition and I wish I had the time to express my views at length on this subject; they would not be very technical, either. I started out years ago with that end of the investigation, and the further I have gone the less occasion I have found for applying my information either chemically or mathematically to the determination of the qualifications of a good steel rail; or, to put it in a different way, to find out in advance the best rail for our purposes, and to know when we have got it. Of late years the impression has been growing on me that the designers and manufacturers will have to specialize in this branch of railroad engineering, as has been found necessary in other branches. That is to say, that what is wanted in the way of a rail for a rock-ballasted road is not what we want in our territory, where, for instance, in 1000 miles of road in our system there is not one mile of rock or gravel ballast or any probability of obtaining it. When we first began to use steel rail, its cost being so excessive as compared with iron rails led us to use a light section—that is, 50-pound. As our equipment and trainloads increased in weight, we have replaced it in a great measure with a 60-pound section. On taking up the 50-pound rail, we found them bowed at each end, as if the base had become lengthened under the rolling of the trains, and yet very little wear on the heads. For instance, in taking up a number of rails near Savannah, where our traffic was the heaviest and where they had been down 10 years, we found a loss by wear of about 3 pounds per rail of 30 feet. This may be accounted for by our exceptionally low gradients and long tangents, but it is a fact, or at least we consider it one, that the trouble with us is not the wear of the head, but the bending upward of the rails at the ends, which would seem to show that rock ballast will wear off the head of a rail faster than it would wear on an unballasted road, and that in designing a heavier section for our sandy road-beds, we do not need so much metal in the head of the rail, but we must seek to make the rail higher and perhaps broader. With that end in view we have recently designed a section of a 70-pound pattern, 5 inches high and with a base of 5 inches, using the same metal in the head that we now use in our 60-pound rail—that is to say, we are providing for increased stiffness and not for increased wear.

A Western engineer says:

For physical test of rails the Pennsylvania Railroad specification seems to be in the right direction; as to the chemical test I am not prepared to say. The question of the constituent properties of rails is still in doubt. The conditions under which rails are used, laid in track and taken care of vary so much on different roads, and the experience is so different that the matter has scarcely received sufficient attention for any one to say just what is the proper make-up for rails.

Another Western engineer, who is much more than commonly well informed, writes:

I think the drop test for rails a good one, so far, that while it does not prove that a rail is a good one, it does indicate what are worthless ones—that is, those that are quite too brittle to be safely laid in track, and I think the same may be said of chemical analysis of rails. It may show whether a rail contains too high a proportion of an element which is well known to be injurious to the metal, without, however, showing just what proportion of elements constitute a good rail. Our analyses of rails so far have not been very satisfactory, but from the work in that line which we now have in progress, we hope to obtain some valuable results. I would attach more importance to physical tests than to chemical analysis, and perhaps more important than either would be a study of the mechanical treatment of the metal in the manufacture of the rail. Our company prescribe neither physical nor chemical tests in their specifications, but take their rails on the guarantee plan.

I think there has been somewhat of an improvement in the wearing qualities of rails made within the last two or three years, though not yet up to the standard of 10 or 12 years ago. One reason for the failure of rails of recent manufacture is the excessive weight per car wheel which is brought upon them; while old rails which have become "case hardened," so to speak, under lighter rolling-stock are better able to stand the crushing force of the present heavily weighted wheels. An engineer, who has had large experience with English rails, finds those made now much inferior to lighter rails made a dozen years ago. This has been true for several years, and many rails have been taken out of track after 18 months' service. They failed chiefly from flattening at the points. The rails are too soft.

* This rail was shown in the *Railroad Gazette*, December 7, 1888. It has a head $2\frac{1}{2}$ inches wide and $1\frac{1}{4}$ deep, containing about 4.4 per cent. of the total metal. This head is relatively considerably lighter than most modern sections.

A Canadian engineer writes:

I have almost reached the conclusion that the inspection of rails is a useless service, as, under the same specifications and the same inspector, and, I may add, under the same contract, one delivery of rails may turn out hard and brittle, while another delivery may prove to be as soft as lead. My belief is that under the present process of manufacture the makers are unable to insure a specific quality of rail.

Mr. E. P. Hannaford, Chief Engineer Grand Trunk Railway, writes:

First let us look at the position of the manufacture now and as existing some 18 years ago, when steel rails were first introduced on this continent as a system. In 1870 the engineers of railway companies accepted steel rails on the good faith of the manufacturers, with some misgivings and anxiety, it is true; but in those days railway engineers knew but little of the manufacture of steel rails, and, as a rule, everything was left to the good faith and integrity of the manufacturer, and in some cases a guarantee for a term of years was given. The imported English rails of early years, from 1870 to 1875, gave satisfaction; their wearing life under a heavy traffic was put down at 15 years, and time and service have proved their durability to be equal to the anticipation. Even up to the year 1880 the imported English rails were good in quality, although not so good as during the first five years.

From 1880 to the present time there has been a gradual falling off year by year in the wearing quality of imported rails, until their life

1870 to 1875 will outlast in wear and time two-fold rails made by the same makers ten years later.

Now, inasmuch as railmakers of early years under the Bessemer process know all about the cause of the decrease in wearing ability, I approach the point of endeavoring to set them right, with a great deal of diffidence in my ability to do so. It seems to me very much like a patient prescribing for himself and the doctor looking on with placidity, well knowing that he (the doctor) is master of the position. Having given you the task that railway engineers have before them, I will give you what I consider about the best constituent parts for a 65-pound rail, gathered from the reports of the composition of rails that have given good and bad results, bearing in mind I do not run the laboratory:

Carbon.....	0.40	Manganese...	1.10 to 1.20
Silicon.....	0.08	Phosphorus...	0.07

And by increasing the weight of rails, say, to 75 or 80 pounds per yard, the carbon may be increased to 0.50 to 0.55.

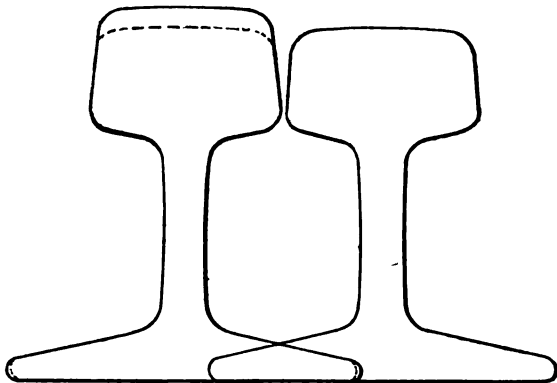
Now, as to the falling weight test. I am not a believer in such, aptly called "barbarous," usages as have been sometimes practiced. The great object to arrive at is the toughness of steel at its maximum of hardness. A weight of 2000 pounds from 18 to 20 feet, two or more blows applied will test this; and if the material is tough, that is sufficient; but if it snaps off then there is the presence of too much phosphorus or sulphur in the ore—i.e., when the above quantities of carbon, silicon and manganese are used; and it must always be remembered that the bulk ore should be chosen with a natural minimum percentage of phosphorus

more information than a drop test. The demand for harder rails which has set in within a comparatively recent period will very likely result in some of our leading railroads establishing a test for hardness.

If I were purchasing for a large railroad I would analyze occasionally. I would want to know that phosphorus and sulphur were within bounds, and that the manufacture was systematic; and yet, after all, we find ourselves unable to tell very much about the value of a rail from the record of its constituents. Within the proper limits for the various elements there is room for very wide differences in the actual qualities of the rail.

There are two objects in inspection—first, to see that the rails are mechanically perfect, and, second, to know that they are made of good steel. The first is easily accomplished by a man having such experience as has usually been acquired by the ordinary inspector. To be of much value in the direction of the second requirement, the inspector should be thoroughly familiar with every stage of the manufacture, and conversant with the various conditions that affect the ultimate condition of the steel. To such a man the ordinary physical and chemical tests are useful only as an occasional check.

I believe the average output to be more uniform in quality than formerly. With some mills I know this to be the case. While much has yet to be learned, the years have brought their lessons, and the various processes are now under better control. I think, also, that most of the mills are now turning out harder rails than they were, perhaps, one year ago. Of course such steel will show higher resistance under test. Whether it will be more liable to breakage in the track remains to be seen. There is some danger in going too far in this direction with the light sections generally used.



The Rail Head Described by J. D. Hawks. Chief Engineer Michigan Central.

cannot be depended upon with any certainty. The same experience is applicable to rails made in the United States—the earlier made rails are better than those of more recent years. This falling off in the quality of steel rails has led railway engineers to study the component parts of the rails, with a view of helping the manufacturers in their endeavors to turn out good wearing rails.

Now, why are the rails of late years inferior in quality to those of earlier years? The answer is to be found in the demand for rails increasing the price. Thus, rails in 1880 to 1885 at the mills' mouth, in England, worth from \$80 to \$50 per ton, and in the United States from \$115 to \$80 per ton, are now down to \$20 in England and \$30 in the United States. It is useless for railmakers to say that the same ore is used and the same care in manufacturing Bessemer-steel rails is exercised now as in previous years, because facts prove the contrary. The falling wear of rails of recent years' make is evidence against such assertions.

The manufacturer who was in business in the early years knows all about the reasons of the falling away in quality, but he cannot restore the lost elements of wear. The enormous demand and output exacts his attention, and the competition in price precludes his reverting to what are termed the old-fashioned methods of 20 years ago; but, nevertheless, these original makers know all about it, and the why and wherefore rails are not so good in lasting powers as at their first introduction. Some of the makers have said: "True, the rails of early years wore well; they were hard; so hard that they caused accidents by breakages, which now happily are almost unknown." Not so. Rails did not break more in the early years than those in later years; but the fact is that the rails of late years are not nearly so good as those of earlier date. And my experience goes to show that rails made by the same maker in

and sulphur, and that if ores are used with a natural high percentage of phosphorus and sulphur, then the extraction or reduction of these injurious elements has to be done by what is known as the "basic process," and a good rail cannot be relied upon.

I cannot divest myself of the feeling that much of the failure of latter years is the result of using ores inferior to what were used when Bessemer rails were first introduced, and in closing I desire again to say that while we maintenance engineers can give railmakers results, yet we are only secondary to them in knowing how to overcome the cause of failures. All the engineers' prescriptions and rail inspectors' elaborate reports will not, in my opinion, secure wearing service equal to rails made 15 and 20 years ago. I believe that railmakers are desirous of making good rails, but the market price and tonnage output limits these conditions, and that if a railmaker turns out rails as good as those from his neighbor's mill it satisfies his conscience, and, if they are not as good, then the railway engineer or inspector will possibly come in for a good share of the failure as participating in manipulating the ingredients making up the rails, and the more the patient interferes with the doctor the worse in my opinion it may be for him. Let us look at net results, the doctor to effect the cure or blame him for incompetency.

Mr. W. F. Mattes, chief engineer and manager West Superior Iron and Steel Company, writes:

Physical tests upon specimens cut or forged from pieces of the rail, or forged from sample castings of the heat, have little or no value. The drop test undoubtedly gives some indication of the toughness and safety of the rail, but throws little light upon its wearing qualities. I am inclined to think that a torsional test upon specimens several feet long, recorded by a large Thurston machine, would give much

Our contemporary *Industry* states that Mr. John Heald, proprietor of the machine works at Crockett, Cal., has discovered that rust may be prevented by painting the work with turpentine and white lead. "It is found that when surfaces are coated with finely ground lead thinned with spirits of turpentine no corrosive action or scaling takes place, even when heavy coats of paint are afterward put on the outside. Mr. Heald says that common paint mixed with oil is too thick to penetrate or close the imperfections of the surface and penetrate beneath the scale where it exists, thus leaving places for corrosion to begin beneath the paint. With turpentine and white lead mixed thin the very pores of the iron are closed. The interstices, to so call them, are too minute to receive the body which oil gives, but are closed by the thinner compound. This is the theory, but that is a matter of no consequence so long as the fact is known."

From the New Castle (Pa.) *Guardian* of the 14th inst. we take the following information: "A series of experiments were tried at the Etna Iron Works, this city, Monday, in the manufacture of steel spikes. The object is to make a finished article by rolling the bar so that its width will be the length of a spike and in such a shape that the spikes may be cut from it with shears, pretty much as a cut nail is made, except that the head is formed in the rolling process. The rolls were turned by Charles & James Mathews, of this city, and were set and operated under the direction of Mr. R. Garvin and Superintendent T. M. Sweeney. At noon the first test was made by running through some steel rails that had been slowly heated for two and a half hours. The result was fairly successful, and it is thought that a few changes in the rolls will make the operation entirely satisfactory."

The freight rates from Pittsburgh to all Texas common points have been advanced and took effect on the 20th inst. The new rates are as follows: First class, \$1.63; second, \$1.42; third, \$1.21; fourth, \$1.06; fifth, 85 cents. Class A, 91; B, 82; C, 72; D, 58; E, 50 cents per 100 pounds. Iron and wire are in carloads fifth class.

not improbable that the time will come when they may be able altogether to dispense with supplies even of the finest tool steel, which they now get from Sheffield.

Portable Power Drill.

This drill can be readily and firmly held to the work and will drill in any position, at any angle and at any direction from the power. The construction of the drill is clearly shown in both the accompanying engravings. The larger, or driving gear, is operated by a grooved pulley, with which a clutch is adapted to engage to operate the small or feed gear. The feed is automatic and sufficiently powerful to stand the greatest strain a twist drill can be subjected to. At the base of the drill is a threaded hollow stud for securing the machine to the brace, or jig, after the latter has been properly adjusted for the hole to be drilled. The illustrations show the method of holding the drill to the work by means of the jig and dog. It is evident that with jigs of suitable form the drill

the non-Bessemer ores. From my own notes I am not able to furnish many complete analyses, such being seldom required of me, but I subjoin two which may serve to show the character of the two classes.

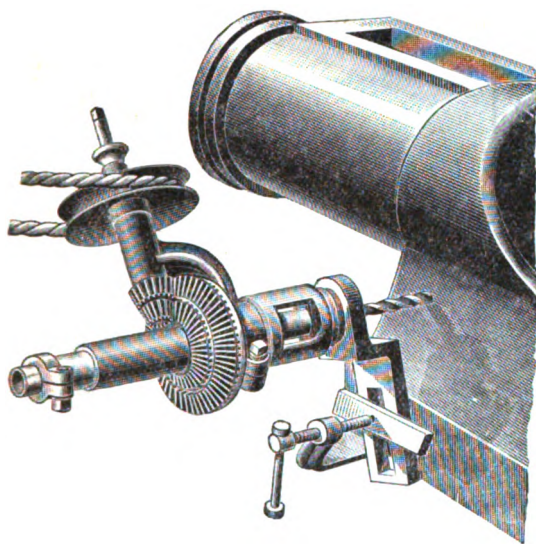
Analyses of Roasted Ores.

	Bessemer.	Non-Bessemer.
	I.	II.
Silica.....	9.20	17.18
Carbonic acid and water.....	.55	undet.
Iron { FeO.....	2.85	Bisulphide iron 1.47
oxide. { Fe ₂ O ₃	63.03	65.73
Alumina.....	2.19	3.02
Lime.....	6.80	4.35
Magnesia.....	7.13	5.72
Oxide of manganese.....	3.90	2.66
Phosphoric acid.....	.102	.319
Sulphur.....	1.788	....
Oxygen with sulphur.....	1.58	....
	99.12	100.449
Metallic iron.....	46.34	46.70
Phosphorus.....	.044	.139
Sulphur.....	....	.786

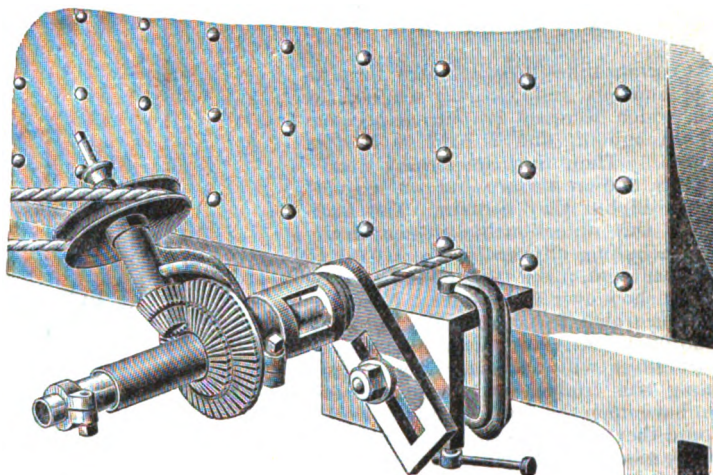
The ore always contains a considerable amount of water—sometimes, when it has

in color, very hard, has a glazed surface, from which the hammer rebounds sharply, and occurs in lumps the size of a man's head, attached to other clinkers, but plainly of separate nature. In the mortar it yields a yellowish powder, separable by the magnet into a yellow-gray earth and a sharp, black, glittering sand. The earth contains about 42 per cent. of metallic iron. The black sand contains about 53 per cent. of metallic iron.

Another clinker is apparently also from a single ore lump, but has no evidences of fusion, no glazed exterior, and retains its original form. It is very hard and heavy, presents a glistening black fracture with evidence of sulphur, and often contains 60 per cent. of metallic iron. Another resembles a slag-finger seen at the tuyere of a chilling furnace, or an ore-stalactite formed on the bottom of something and then broken off. These I have occasionally seen forming at the kiln-gates, the fused matter trickling down the wall when the kiln was "in trouble," a condition corresponding to a scaffolding furnace.



Drilling Engine Bed.



Drilling Locomotive Fire Boxes.

PORTABLE POWER DRILL, MADE BY J. J. McCABE, NEW YORK.

may be held in almost any desired position. These drills are manufactured by J. J. McCabe, of 121 Liberty street, New York.

Roasting Hudson River Carbonates.*

BY INGERSOLL OLMSTED, BURDEN, N. Y.

The Hudson River carbonate ores are of two classes, Bessemer and non-Bessemer, existing in separate, though adjoining beds. Both are carbonates, with small admixtures of oxides and other combinations. To prepare them for market they are roasted in kilns 60 feet in height. They have wrought-iron shells 24 feet in diameter; are lined with fire-brick, and supported by cast-iron mantel and columns. As originally built, the draft was wholly from the bottom; but afterward two rows of small circular holes were cut in them, a little short of half way up, and encircling the kila. The kilns are 10 in number, with an estimated roasting capacity of about 100 tons daily each.

The richer of the two classes of ore is a true Bessemer, containing only about 0.035 per cent. of phosphorus. It is uniform in character and unmarked by any specially interesting features. In the present paper I purpose to speak mainly of

been exposed to rain, as much as 8 per cent. It is but fair to say that the sulphur in I is much higher than the average, and that the iron in II is a trifle higher than I have generally found. The form of the roasted ore is varied, but examination shows four main characteristics, which may be classified thus:

- I. A rough, shapeless mass.
- II. A fine-grained, flat slate.
- III. A mixture of white silica-grains with red or black ore-grains, occurring mainly in thick, flat slabs.
- IV. "Clinkers," so-called.

The analysis of many pieces of each class points to the rough generalization that Nos. I and IV are the richest, the others mostly lean, though stray pieces of one class occasionally approach those of another so closely in percentage of iron that the line becomes hard to draw.

Class IV presents the most interesting features. For some reason not yet clear, these clinkers form in the kilns, and, descending to the gates, give trouble by being too large to pass through, and requiring blasting. They are, in the main, roughly rounded masses, from 18 inches to 3 feet in diameter, composed of pieces of ore, rock, coal ashes, &c., cemented together with fused ore or something similar. But there are many of a different nature. One appears as though formed from a single ore lump; it is nearly gray

A prominent characteristic of the "cemented" clinkers is that they often contain pieces of Class III; but such pieces show no evidences of fusion or alteration, and are only stuck to the rest of the mass. In spite of close study with a magnifying glass I have not been able to connect any other particular form of ore—the slate, for example—with this clinker formation, nor have I ever seen any fused or altered rock. Moreover, the lumps of ore never seem to show the beginning of fusion arrested there. All these facts point to complete change taking place in one kind of ore.

The reason for this clinker formation remains an open question. Too much heat has been the cause commonly assigned; but that of itself would not produce the metallic iron visible in them. To test the action of heat upon the ore I placed some, in inch-cube size, mixed with coal, in a Hessian crucible, and exposed it to the full heat of a gasoline furnace, keeping the crucible at an almost white heat for hours, but failed to produce any effect except thorough roasting—this, too, although I varied the conditions, with crucible open and closed, by charging wet ore and coal-dust, &c.

I then considered that there must be some action of oxidizing and reducing gases at the bottom of the trouble; that it might be promoted by the ore remaining longer in or near the fires than is necessary

* A paper read at the Buffalo meeting of the American Institute of Mining engineers.

to completely roast it. This might easily happen, since the drawing of the kilns is regulated by the appearance of hot ore at the gates, the convenience of shipment and other causes, not by the time necessary to roast. I do not know that that length of time has ever been precisely determined here. Clinkering might also arise, I thought, from some of the ore fusing or reducing more easily than the rest, and thus running in the fire necessary to roast the more refractory.

In our non-Bessemer vein there occur constantly seams of black slate, generally narrow. It is very siliceous, fine-grained, nearly black between the gray natural ore, breaks into thin plates, and furnishes my Class II. Besides its carbonate of iron it carries from 1 to 15 per cent. of some other iron combination, insoluble in concentrated boiling acid. May not this fuse readily, and, under some conditions, cause trouble? To follow up the investigation on this line I designed a special apparatus for roasting samples in the presence of different mixtures of oxidizing and reducing gases, but have not been able as yet to carry on the experiment. It is on this point that I invite discussion—namely, the reason for the formation of clinkers described. Perhaps I ought to add that our fuel is good culm, and the charge fixed by practice as best is about 1 ton of fuel to 30 of ore.

At certain times these clinkers form in large numbers and virtually scaffold the kiln, which decreases its output, becomes hot throughout, and is said to be "in trouble." Then they are termed "bad" clinkers, and are thrown out on account of the sulphur they contain. The average of this objectionable element in the ore, including clinkers, is from 0.70 to 0.90 per cent.; but the clinkers alone usually show over 2 per cent. Now, the question which I wish specially to recommend to the attention of furnace men is, What effect will charging these masses among our friable and easily reducible ores have upon the furnace and its work? Would they need more exposure to the reducing gases than the porous ore, and thus, while descending low in the furnace while yet partially unreduced, cause irregularity of working? Would it be advisable to reject them, supposing them to constitute a small portion of the ore only?

The sulphur in our roasted ore has generally been supposed to exist as sulphuric oxide. I think Mr. Sherrerd, of Scranton, holds this view. It is also said to roast off in the furnace and not to affect the iron. Now, would this hold true of the clinkers? Is not the sulphur more likely to be in them as pyrites, and, in such hard masses, to descend into the zone of fusion? I regret that it is impossible to give any complete analyses of these clinkers, which might aid much in the solution of such questions. I have only a few fragmentary tests for iron and silica, which do not show anything.

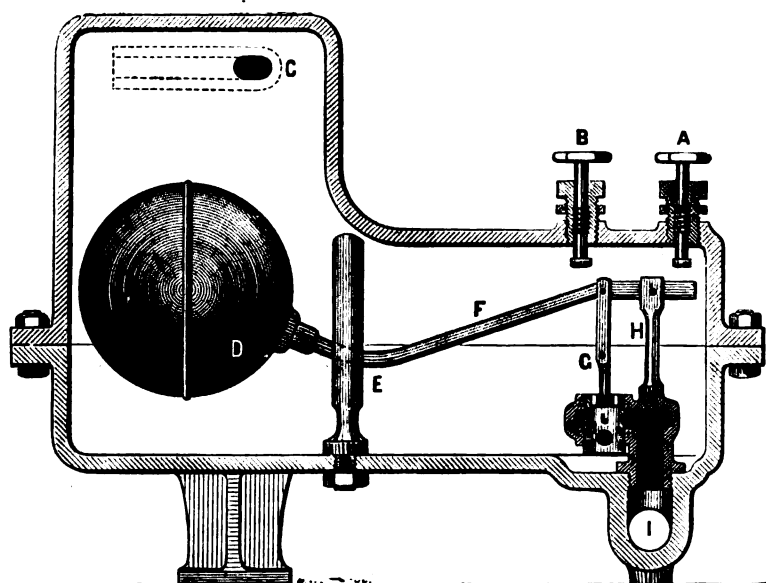
Apparently, the ore was designed to confound many pet blast furnace theories. For instance, I was once told that it would not make a large percentage of No. 1 or No. 2 iron, because of its manganese (2 to 4 per cent. of the black oxide) and sulphur; but since then I have seen a furnace, running on this non-Bessemer ore alone, make nothing but No. 1 iron for days together. In that iron I found from 1.75 to 2.25 per cent. metallic manganese and only a trace of sulphur. The iron, when raw, was covered with the cloud of sparks, which ordinarily accompanies cold iron, and the slag had a chocolate-colored or nearly black surface, yet contained, nevertheless, only a trace of iron. The fumes at casting were remarkably dense and sulphurous, and I more once noticed in them the odor of cyanides. The iron made exceptionally good castings, and pleased the foundrymen very much.

The variety in appearance and in composition of the samples of this non-Bessemer ore is very striking. Upon my table lie upward of 100 lumps, all tested and tagged, with the percentage of iron at least, often with that of silica and manganese. The silica in many is plainly visible to the eye in pure white grains scattered through the mass, or in narrow veins which under the action of fire become brittle and split the mass throughout, leaving the white crystals upon one face. In others, as in the black slate, the silica is entirely in combination. The percentage of iron varies from 7 to 56, though even to the trained eye there is very little difference in appearance. Some contain so much lime that on mere exposure to the atmosphere they have slacked into a heap of dust, though they carried over 40 per cent. metallic iron. These peculiarities have occasioned much trouble with our customers, and complaints of rock, dust, careless preparation, &c., from those who are ignorant of the originally mixed condition of the ore in the vein, and the confusion unavoidably resulting from the

The experiment has been well confirmed, and seems to show that our leaner, more siliceous, non-Bessemer ore really consists of a mixture of rich ore with veins and lumps of lean, phosphatic stuff. There is no such difference visible in the natural ore, nor do the tests of diamond drill cores and daily drill-samples from the mines encourage the belief. I am, nevertheless, inclined to cling to the theory, in part at least, and to consider the other disagreeing results to arise from the intimacy of the mixture, rendering a drill-core witness only as to the ore it actually contains.

A New Steam Trap.

The steam trap invented by George W. Baird, of the engineer corps of the U. S. Navy, is being manufactured by Watson & McDaniel, of Philadelphia. It was designed to work with the Baird distillery apparatus, and several are being fitted to the fresh-water distillers on board the new cruisers Yorktown, Charleston, Concord, &c. The water from the heaters enters the



NEW STEAM TRAP, MADE BY WATSON & McDANIEL, OF PHILADELPHIA.

roasting and consequent alteration of form. A knowledge of them, together with a laboratory accident, led me to make the following experiment:

A large sample of non-Bessemer ore was reduced to a coarse powder, divided into halves, and these marked respectively Nos. I and II. No. I, without any further preparation, was passed over a 60-inch sieve, and the resulting powder marked A, the fine ore, tailings, &c., being marked B. No. II and A and B were then carefully sampled and analyzed, with the following results:

	II.	A.	B.
Iron.....	39.06	44.51	37.70
Silica.....	23.95	18.40	27.
Phosphorus.....	0.201	0.120	0.270

A partial repetition of the experiment, the analysis of II being omitted, gave:

	A.	B.
Iron....	43.05	36.92
Silica.....	20.53	29.53
Phosphorus.....	0.102	0.183

The samples originally taken did not fairly represent the ore, being leaner than the average; but this did not defeat my intention, which was to learn whether a richer separated ore could be obtained by such screening. If, as my experience goes to show, the soft ore is the rich and desirable, then the difference would have been more marked had the proper proportion of rich ore existed in the samples.

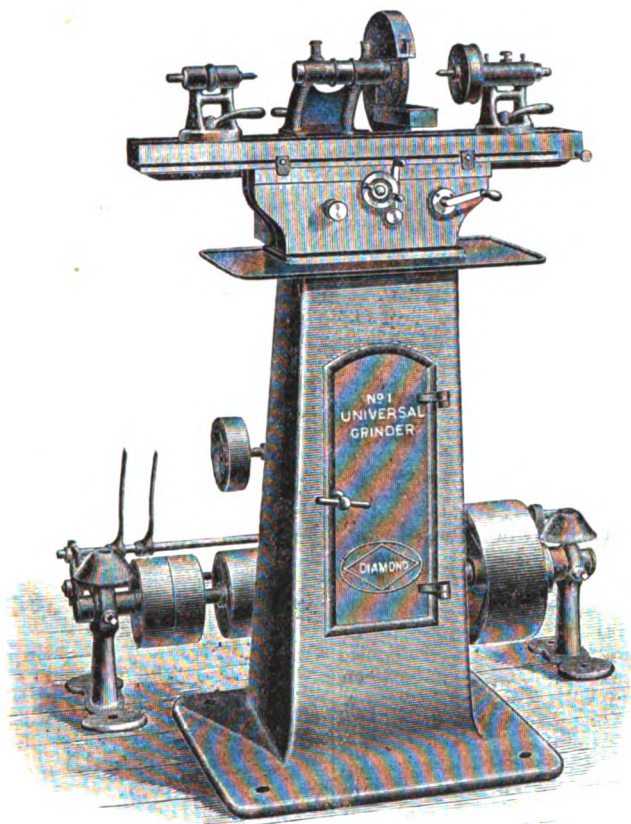
trap through the opening C. In the chamber is the spherical copper float D, which is mounted upon the lever F, fulcrumed to the post H. As the water enters the trap, the rising float opens the valve J, by means of the rod G, enough to bring the portholes in it opposite the holes in the cylindrical case in which the valve works, when the water flows out through the passage I. By turning the valve-wheel A the lever may be raised and the valve opened by hand. Turning the valve-wheel B will close the valve. These wheels are intended only to be used in case the valve J sticks or becomes clogged. It is evident that this trap will operate as freely at one pressure as another. The trap cannot be flooded, as the piston openings are equal to the inlet and discharge pipes. There is an opening in the end of the trap, by which it can be connected direct to the waste-pipe, so as to blow all sediment from the bottom. A board of United States naval engineers examined the trap on the Albatross, and in recommending its use on naval vessels said: "The advantages are the employment of a piston valve perfectly balanced for the discharge, certainty of action, small space occupied, cheapness, lightness, it is automatic, has a large opening for discharge, and can be shut off or blown through by means of the hand attachment on the piston valve."

Universal Grinding Machine.

The machine illustrated is designed for grinding light work, straight or taper, soft or hardened spindles, arbors, cutters, reamers, &c., and also for grinding out rings and hardened boxes by means of a special chuck. The table has both automatic and hand feed, the change being made from one to the other by simply turning a knurled handle in front of the machine. The work can be revolved upon dead center or otherwise, and the wheel is brought to and from the work by means of a screw and hand-wheel, and is arranged to use water to prevent drawing the temper on hardened work. The machine has a swing of 8 inches in diameter by 16 inches long, but is not designed to grind work as large in diameter and length as the capacity given. It is the smallest of

posed for two or three minutes to the action of the vapors of the heated mixture of hydrochloric acid and nitric acid in equal portions, at a temperature ranging from 550 to 650° F. After the objects have cooled, they are to be rubbed over with vaseline and again heated until the vaseline begins to decompose. This treatment with the vaseline has to be repeated once. Should a lighter coloring than bronze be desired it can be produced by mixing acetic acid with the other acids.

Some interesting information respecting the jade of Burmah is contained in an Indian Blue Book, lately received from Rangoon. The jade mining district is a large tract of country, chiefly on the west side of the Uyu River. The Kachins, though acknowledging Burmese authority, regard themselves as owners of the mines. The



UNIVERSAL GRINDING MACHINE, BUILT BY THE DIAMOND MACHINE COMPANY, OF PROVIDENCE, R. I.

the machines made by this company for this class of work. The Diamond Machine Company, of Providence, R. I., the manufacturers of this machine, have a Western office at 51 South Canal street, Chicago, Ill.

Proposals have been invited by the Secretary of the Navy for the construction by contract of an armored coast defense vessel of about 4000 tons displacement, complete, exclusive of armament. Bids will be opened at the Navy Department at noon on February 20, 1889. The material used in the construction of the vessel is to be of American production and furnished and manufactured in the United States. The armor, armor bolts and the accessories are to be furnished by the Government, and the contractor is to fix, place and secure the armor to the vessel.

A German technical journal gives the following method of producing a bronze-like surface on iron or steel, which prevents rust: The object to be acted upon must be cleaned so as to take off all oxidation or other impurity. It is then ex-

posed for two or three minutes to the action of the vapors of the heated mixture of hydrochloric acid and nitric acid in equal portions, at a temperature ranging from 550 to 650° F. After the objects have cooled, they are to be rubbed over with vaseline and again heated until the vaseline begins to decompose. This treatment with the vaseline has to be repeated once. Should a lighter coloring than bronze be desired it can be produced by mixing acetic acid with the other acids.

jade is sold chiefly to the Chinese, the headquarters of the trade being at Mongaung. The best quarries in recent years have been those of Hsimu, Masa, Mopang and Tamukan. It appears that Burmah is the only source whence the Chinese draw their supply of this highly prized mineral. The Chinese Lun Pein, to whom the British Government had farmed the jade-tax, was assassinated a few months ago in consequence of his unpopularity.

The Navy Department, Washington, D. C., will receive proposals until 12 noon, on Friday, the 15th day of February, 1889, for constructing and furnishing the machinery, including engines, boilers and appurtenances, required for the United States armored cruiser Maine, and for erecting and connecting the same on board said vessel at the Navy Yard, Brooklyn, N. Y. All the machinery, including engines, boilers, screw propellers, shafting, pumps and all appurtenances, is to be of the best and most modern design, and to be constructed in accordance with the plans and specifications provided or adopted by the

Secretary of the Navy. The engines must have all necessary appliances for working under forced draft.

The Naval Appropriation.

The only new vessels called for under the new Naval Appropriation bill, apart from four steam tugs, to cost \$140,000 in the aggregate, are the steel monitor of 3000 tons displacement, planned by Representative Thomas, and a second cruiser of the Vesuvius type. For the former the price allowed is \$1,500,000. Her engines are to develop a collective indicated horsepower of 7500 and to produce a maximum trial speed of 17 knots. This is the vessel which has the double interest of novelty in her plan for sinking lower in the water as a means of protection when in actual conflict with an enemy, and in her adoption of a 15-inch 110-ton rifled gun as part of her armament. The maximum appropriation for the second new vessel is larger than that for the Vesuvius, being \$450,000, and this additional margin of \$100,000 will doubtless allow of greater size or more effectiveness in one way or another. The reason for not calling for other new vessels in this bill is doubtless to be found in the fact that there are already several authorized for which the plans have not been prepared. These include two of the most important ships yet proposed, one of them a larger armored cruiser than the Maine, and another a larger a larger unarmored cruiser than any we have, besides the new and fast 2000-ton cruisers.

There has been built at Altoona for Geo. Westinghouse, Jr., a car which will be called the "Instruction Car," designed to exhibit to railroad men the practical workings of all the Westinghouse appliances, consisting of working models of the latest improved air brake for passenger and freight cars, the new friction buffer air signal, steam heating apparatus, electric lighting, and in fact everything pertaining to the mechanical equipment. A 15 horsepower boiler will supply steam to a Westinghouse engine which will operate a dynamo, while a tank with a capacity of 6000 pounds will carry a supply of water under the car.

Invention states that the first instance known of machinery being applied to the making of screws was in France, in 1569, by a man named Besson, who contrived a screw-cutting gauge to be used in a lathe. In 1741 Besson's device was improved by Hindley, a watchmaker of York; and for a long time the watchmakers of England employed the latter's method in making the small screws used in their work. The first English patent appears to have been issued to Job and William Wyatt, in 1760, for three machines—one for making blanks, another for nicking the heads, and a third for cutting the threads. Between that date and 1840 about 10 patents were issued.

The Valley Forge Natural Gas Company are now busy drilling a well for natural gas at Valley Forge, not far from the building known as "Washington's Headquarters." William McCabe, who is performing the work, drilled, so far, about 100 feet. It is reported that strong indications of gas were discovered some time ago when drilling the artesian well for the Hays paper mill.

According to a correspondent of *Industries*, the Russian Minister of Railways proposes asking for a credit of 9,300,000 roubles for the purchase of 300 locomotives. Each engine, according to these figures, will cost over \$23,000. The engines are all to be built in Russia.

THE WEEK.

The recent decision of the United States Supreme Court in the great patent case of the Bate Refrigerator Company *vs.* Hammond & Co. has had a startling effect on the electric lighting business. It is said that it means the gain of many millions of dollars for the Edison company, owing to the fact that a great number of patents which had been thought to be valueless are now found to be worth large sums.

Hippolyte, who opposes Legitime in Hayti, is reported to have come into possession of two gun-boats, one recently purchased in New York and the other in France. The armament received from New York comprises nine Gatlings, which will be manned by American gunners.

Chancellor Bismarck, in a speech before the Reichstag, 26th inst., declared that both in Samoa and on the East Coast of Africa the Imperial policy is thoroughly in accord with that of Great Britain. Respecting commercial prospects in Zanzibar he regarded the enterprise undertaken by the East African Company as one that must be sustained, in order that Germany utilize the products of her own colonies.

The annual report of the New York State Comptroller states that for the current year the State tax is \$9,089,303, the rate being 2.62 mills and the valuation \$3,469,199,945. In one year the assessed valuation of real estate has increased by \$97,358,296, while the increase of assessed personal property was only \$10,913,472. It is believed there is over \$2,500,000,000 of personal property in the State that is not, but ought to be, taxed. There was invested in capital of corporations organized in this State during the last fiscal year the sum of \$145,470,616, which is more than one-third the entire assessed valuation of personal property within the State.

The American Minister to the Court of St. James, Mr. Phelps, was honored by a remarkable banquet by the Lord Mayor of London prior to his departure for America. So good an authority as Robert Browning said in private talk that he believed it to be one of the most notable assemblages Europe had ever seen. Practically the whole Supreme Bench of England were present, with Lord Chief-Justice Coleridge at their head, and the best representatives of science, art, literature and commerce which the country affords.

It is reported from official circles in Ottawa that more stringent regulations than ever are being arranged for promulgation during the coming fishing season, and the entire fleet of fishery-cruisers will make things unpleasant for the Yankee skippers. Orders having gone out for the exclusion of Canadian railway cars from traffic between stations on the American side, annoyance of the skippers will be "tit for tat."

A careful computation of the value of farm products in the United States during the crop year of 1887-88 affords evidence that the money value was in excess of the total realized in the previous year. For grain and cotton alone the gain is supposed to reach nearly \$100,000,000, but the export movement having been retarded to an unusual extent by speculative influences, the total net cash available for expenditures in other lines of industry may be considered yet in reserve.

At a cost of \$2,500,000 the Pullman Palace Car Company have absorbed all rivals, with a single exception, the Wagner Company, which runs cars only on the Vanderbilt roads.

George McKay, deputy State inspector, testifies that he has 17,000 factories to look after, and this statement is made in

extenuation of the fact that at the inquest in the case of the Fifth street factory fire last week it was discovered that the building had no fire escapes. The law regulating this matter had not been enforced, and the question arises which party was most liable to a grand jury indictment, the owner of the building or the inspectors.

The Railroad Commissioners of Minnesota recommend to the Legislature that the "common car stove" should be excluded from all trains.

Over 2000 dwellings have been erected in Pittsburgh within the last year, and prospects are considered better for the year 1889.

City lots in St. Louis valued at \$500,000 have been transferred to the Q road for conversion into railroad yards.

The latest plan for protecting New York harbor is to convert the waters of the bay into an ocean of flame by suddenly releasing a flood of petroleum from submerged iron pipes and applying a match. Somebody pointedly observes that "a vast body of flaming oil sweeping up through the Narrows must be a nice thing for New Yorkers to contemplate."

The resources of Wyoming are destined to make that Territory important among the States of the American Confederacy. Delegate Carey, in a statement before one of the Congressional Committees, said the coal lands in the Territory covered an area of not less than 5,000,000 acres; her oil lands were more than equal to all the oil lands in Pennsylvania, Ohio and West Virginia combined, and she had as fine iron deposits as are found in the United States.

Telephone subscribers are making a demonstration at Albany in favor of reducing charges.

Plans for the improvement of New York harbor have been submitted to Congress by Lieut.-Col. Gillespie, Corps of Engineers, through Secretary Endicott, which contemplate a ship channel between Jersey City and Ellis Island, where now there are only 4 feet of water at mean low stage, except near Port Liberty; also a ship channel or basin between the deep water of Hudson River and Ellis Island, to comprise about 70 acres, and of sufficient capacity to accommodate conveniently 250 vessels at anchor, after allowing an open channel on the north side for convenient communication with the adjacent wharves.

A new tunnel under the Chicago River, to cost \$1,500,000, will be constructed by one of the street railway companies.

The president of the Dock Commissioners explains the delay in carrying out the plans for improving the water front in New York City, arising from difficulty in acquiring and obtaining control of the property of private owners. Until this can be accomplished, private owners are prohibited under the law from improving their property along the water front in accordance with the plans of the commissioners. Simon Stevens, who is attorney for the owners of the greater part of the water front now in private hands, said: "The delay is attributable wholly to the Commissioners of the Sinking Fund and to the city's Law Department. The entire water front of the city is about 60 miles in extent. The title to about one-third of this below Fifty-ninth street still remains in the city. The wharf rights of the other two-thirds have been conveyed by the city to private persons, who now hold them under specific grants. The carrying out of the plans of the Dock Commission involved the demolition of all the existing piers and bulkheads within the prescribed limits, whether public or private, and the building of new ones in their places. In

many cases pending for 13 years no affirmative action has been taken by the Law Department of the city to attain a final decision which would serve as a precedent to govern future action.

The Canadian Pacific and Grand Trunk Railways are reported to have reconciled differences, with the effect of shortening time between Ontario and the Northwest, and they expect to cope more successfully with railways in the United States.

The world's supply of sugar, according to the best authorities, is estimated for the present year at 5,240,000 tons, including 2,808,000 tons of cane and 2,432,000 tons of beet-root sugar. This is an increase of 295,000 tons over the yield of 1887-88, which comprised 2,530,000 tons of cane and 2,415,000 tons of beet-root, thus indicating that the quantity of these two descriptions have changed places in relative importance. The imports into Great Britain last year amounted to 892,518 tons, as compared with 897,760 tons in the previous year, showing a small decrease. Meanwhile, however, a remarkable decrease took place in the relative proportions of cane and beet, the former increasing 134,000 tons and the latter decreasing 139,000 tons as a result of the reduced beet crop in Germany last year. British imports from the United States declined 37,000 tons. The estimated consumption per head in Great Britain is 73 pounds, as compared with 52 pounds in the United States, 28 pounds in France and 20½ pounds in Germany. Russia, Italy and Spain average only about 9 pounds per head. The average per capita in our own country has steadily increased at the rate of nearly 5 per cent. per annum.

Jacob Tome, a millionaire banker of Port Deposit, Maryland, has determined to devote \$2,000,000 or \$3,000,000 to establishing a training institution where poor boys may learn the use of tools and receive instruction in any kind of trade they may select. Workhouses will be erected for 500 children, at a cost of \$500,000. In its general features the scheme resembles that of Mr. Williamson, of Philadelphia, and is a form of practical philanthropy worthy of imitation.

A syndicate has been formed in West Virginia, with ex-Senator Camden among the projectors, to build a railroad on the banks of the Monongahela river, and under an arrangement with the Baltimore and Ohio Railroad Company transport coal and coke to Western markets. The scheme comprises a coal and coke company which will build 500 coke ovens on the line of the railroad. About \$2,000,000 have been raised.

The Florida orange train runs all the year round. After the orange season strawberries, asparagus, garden vegetables, water melons, &c., follow in rotation. If weather permits, ventilators are kept open all the way through.

Italians are now the object of the fierce resentment at first directed against Chinese immigration by representatives of organized labor. The Ford bill in Congress, which imposes a head tax of \$5, is expected to operate as a barrier against the importation of cheap labor from Italy and other parts of Southern Europe, and the steamship companies in the Atlantic trade are much alarmed. Railroad companies, on the contrary, manifest little concern, alleging that even though numerous immigrants destined to the United States might disembark at Canadian ports they would eventually find their way across the boundary. The better class would not be deterred whatever the terms of the bill. Meanwhile excluded laborers of any kind will be welcome in the Argentine Republic to compete with the United States in growing wheat.

MANUFACTURING.

Iron and Steel.

Lemont Furnace, formerly operated by R. Hogsett & Co., in Fayette County, Pa., has been torn down and the machinery is being removed to Alabama.

The steel plant of the Glasgow Iron Company, at Pottstown, Pa., has been closed down.

The Bellaire Nail Works, of Bellaire, Ohio, have recently made some very successful experiments in what is known as the direct process. Instead of running the material from the blast furnace into pig beds, it is taken direct to the Bessemer converters in ladles. By this process there is a slight economy in labor at the blast furnace, and also in the steel department, and in addition there is the saving of the fuel required in the cupola. The chief advantage claimed for the process, however, is the superior quality of the steel made, as it is claimed that it contains less sulphur on account of not having to be remelted, thus avoiding the absorption of sulphur contained in the coke. The greater part of the product of the blast furnace, about 140 tons per day, is now used in the direct process.

Two new double furnaces are being added to the puddling department of the Lochiel Iron and Steel Company, at Logan, Pa.

On Monday, the 21st inst., notices were posted on the plant of the Pottstown Iron Company, at Pottstown, Pa., of a reduction of 25 cents per ton for puddling. This reduction fixes the price at \$3 per ton and affects the puddlers, helpers, rollers and others in that department. The reduction is to go into effect on Monday, the 4th prox. It is thought that it will be accepted by the workmen.

A press dispatch from Philadelphia under date of the 24th inst. says: "The Powell Iron Company was organized to-day to conduct the business of the firm of Robert Hare Powell's Sons & Co., which made an assignment for the benefit of creditors August 29, 1887. At the time of the assignment the insolvent firm owed \$2,000,000, of which \$1,000,000 was unsecured. By the present arrangement the unsecured creditors comprise the new company, whose stock is \$1,000,000.

Sarah Furnace, at Ironton, Ohio, which has been idle for some time undergoing repairs, has again resumed operations.

Wellston Furnace, at Wellston, Jackson County, Ohio, operated under lease by King, Gilbert & Warner, of Columbus, Ohio, has resumed operations after an idleness of some weeks for repairs.

At the annual meeting of the stockholders of the Belmont Nail Company, held in the office of the company at Wheeling, W. Va., on Tuesday, the 22d inst., the old Board of Directors was re-elected as follows: A. W. Kelly, William F. Stifel, Joseph Bell, Edward Reid, George G. Hannan, John G. Hoffman, Jr., and Thomas O'Brien.

A change took place in the membership of the firm of Gabel, Jones & Gabel, of Pottstown, proprietors of the Gabel mine, at Boyertown, and lessees of the Norway furnace at Bechtelsville, Berks County, Pa., on the 1st of January, 1889. The interest of the late Major Griffith Jones, deceased, has been transferred to the heirs of his estate, Mrs. J. C. Jones, Miss Jennie Jones and Capt. F. B. Jones, and Messrs. Henry H. and Jacob H. Gabel continue their ownership as before. Mr. George C. Davis is superintendent of the mines and furnace.

Last week the lining in two of the stacks of the Eliza furnaces, owned and operated

by Laughlin & Co., at Pittsburgh, fell in, and it was necessary to blow out both for relining, which will be done as soon as possible, when they will be started again. This leaves one stack still in operation and one building by this firm. When the new furnace will be completed, which will be about May next, the two stacks mentioned above will probably be dismantled, as the new furnace will have a larger capacity than both of the old furnaces combined.

At the annual meeting of the stockholders of the Benwood Iron Works, held at Wheeling, W. Va., the old board of directors were re-elected, as follows: John G. Hoffman, Sr., A. W. Campbell, L. S. Delaplaine, G. B. Caldwell, L. S. Stifel, Jacob Wise and E. W. Paxton.

A press dispatch from Steubenville, Ohio, under date of the 21st inst., says: "When the Cartwright Iron Works failed last June there were preferred labor claims of about \$3500, which Assignee T. P. Spencer to-day paid in full. The general creditors, to which is owing about \$50,000, will receive nothing from the assets of the concern. The old plant is being rapidly converted into an extensive muck iron mill."

The plant of the Keystone Iron Works, Limited, at Reading, Pa., which has been idle for some time, resumed operations on the 21st inst., giving employment to 90 men.

The Reading Iron Works, at Reading, entered for record on January 4 a mortgage for \$600,000 to the Pennsylvania Company for Insurance on Lives and Granting Annuities, of Philadelphia. This mortgage is to take the place of one for \$1,000,000, executed in 1874 to the American Life Insurance Company, made payable in 15 years. Four hundred thousand dollars of the amount was paid out of the sinking fund of the company and the remainder by the proceeds of the new mortgage. Besides thus reducing its indebtedness, the corporation during the last two years have made extensions and improvements costing several hundred thousand dollars.

Morris, Williams & Bailey, manufacturers of cold-rolled steel at Pittsburgh, have recently embarked in the manufacture of finer articles. They are now building up a larger trade in steel for sewing-machine attachments, springs and general stamping purposes. They have finished steel for watch-springs, and are now making a specialty of springs for clocks. They recently booked an order for 25 tons of steel, to be used in making air chambers for dynamite guns.

Moorhead Bro. & Co., proprietors of the Vesuvius Iron and Nail Works, at Pittsburgh, are now preparing to build an entirely new puddling department of 20 double puddling furnaces, and also a new three-high muck train. It is also stated that the company will manufacture fuel gas, having decided to abandon the use of natural gas as soon as their present contract expires.

Huston & Sons' new steel mill, at Coatesville, Pa., is being rapidly pushed to completion. Mr. Kurtz, who recently purchased the Valley Iron Works, has given the contract for a large new iron mill. Craig, Ridgway & Son, founders and machinists, who now have the largest foundry in that part of the State, will enlarge their works in the spring. The large Brandywine Iron Works, owned by Worth Brothers, will soon be in full operation.

At the annual meeting of the stockholders of the Cleveland Rolling Mill Company, of Cleveland, Ohio, held on Wednesday, the 23d inst., the following officers were elected: President, William Chisholm;

vice-president, W. B. Chisholm; secretary, E. S. Page. Directors, J. H. Wade, H. B. Payne, William Chisholm, J. H. Wade, Jr., and W. B. Chisholm.

Mr. S. T. Wellman has resigned his position as superintendent of the plant of the Otis Iron and Steel Company, of Cleveland, Ohio, and will shortly make an extended pleasure trip to California.

Large quantities of machinery for Claus Spreckels's great sugar refinery, in Philadelphia, are being placed in position. Altogether 800 men are employed in the work.

The Chicago Forge and Bolt Company have secured a very good contract for iron bridges for the St. Louis and San Francisco Railroad. Forty spans will be required, involving the consumption of about 1200 tons of material. The company report a very satisfactory outlook for their bridge department, but the demand for axles and other iron work for cars is quite light at present.

The Nashville Iron, Steel and Charcoal Company, located in West Nashville, made an assignment 23d inst. to Robert L. Morris for the benefit of creditors. Though not fully set forth in figures, the assets are claimed by officials of the company to be about \$450,000, and the liabilities \$170,000. Among the assets are reckoned accounts due the company amounting to \$38,882.31.

Machinery.

The Bouton Foundry Company, of Chicago, some time since sold the site of their Archer avenue works to the Chicago, Alton and St. Louis Railroad Company, who needed the ground for other purposes. The ownership of the buildings and machinery remained with the foundry company, who were given a reasonable time to finish their contracts and effect a removal to some other site. Since then important changes have taken place in this company. E. G. Shumway and C. D. Bradley bought out F. W. Barker, and subsequently Mr. Bradley bought Mr. Shumway's interest, and is now the sole owner of the Bouton plant, which he will remove to a point not yet selected, and will start up in some branch of the foundry business. F. W. Barker has formed a partnership with W. R. Gwinn under the firm name of F. W. Barker & Co., and they will manufacture architectural ironwork and fire-escapes. Their city office is in the First National Bank building, Chicago, and they have secured the Williams Foundry at Grand Crossing. They have placed in charge of the foundry the old foreman of the Union Foundry Company, and have had transferred to them the flasks, catalogues and all other property of the Bouton Foundry Company pertaining to architectural ironwork, including the unfilled contracts.

The Dean Brothers Steam Pump Company, of Indianapolis, Ind., have recently added a new duplex pump to the waterworks at Marion, Ind. It has a capacity of 2,000,000 gallons a day, and when tested recently proved satisfactory. The pump already in service there was put in by the Dean Brothers eight years ago and is in first-class condition, being good for many years to come.

H. O. Whitney, Keokuk, Iowa, agent for New Improved Andrus Brick Press, manufactured at Keokuk, Iowa, reports a number of sales of these machines. During the past week they have shipped one to the Grape Creek Clay Company, Grape Creek, Ill., also one to Cambria Brick and Tile Company, Golden, Col. These machines have been on the market for a number of years, and practical experience has taught the manufacturers the defects and remedy for the same, and they inform us their ma-

chines now give good satisfaction, and mention quite a number of duplicate orders, which they have received as evidence of this fact.

B. W. Goodsell, 139 Lake street, Chicago, is actively pushing the introduction of his rubber-back flax piston-rod packing, which was brought before the trade a short time since. He has received a number of very flattering testimonials from those who have tried this packing. It consists of a wearing body of braided Russian flax, having an elastic rubber back securely attached by vulcanization, which overcomes rigid bearing, reduces friction and increases the durability of the fiber in contact with the rod. It works equally well with either steam or water, and is recommended by the inventor as a packing for air-compressors, elevators, &c.

We note that the Valley Iron Works, of Williamsport, Pa., continue to forge ahead with their Valley Engines. A few of their recent orders are given herewith: Tatum & Bowen, San Francisco, Cal., one 100, one 50, one 70 and one 30 horse-power; Northwestern Machinery Company, St. Paul, Minn., one 100 horse-power; Waterhouse Electric Company, Baltimore, Md., four 50 horse-power; Allen Mfg. Company, Chicago, Ill., one 50 horse-power; William K. Calvert, Altoona, Pa., one 30 horse-power; Lanfield, Davidge & Co., English Center, Pa., one 30 horse-power; Winfield Flouring Mills, Winfield, Pa., one 70 horse-power; Montoursville Planing Mills, Montoursville, Pa., one 50 horse-power; Demorest Fashion and Sewing Machine Company, Williamsport, Pa., one 100 horse-power; S. R. White & Bro., Norfolk, Va., one 70 horse-power. They also report orders for a large amount of general machinery, iron and brass castings, &c.

Some time ago we illustrated and fully described a 100,000-pound screw-power vertical testing machine, built by Riehle Bros., of Philadelphia. The same firm now presents a 60,000-pound machine, arranged somewhat similar to the other and adapted for those who do not wish to use one of larger capacity. The dimensions of the machine are as follows: Height, 6 feet; length, 8 feet; width, 2 feet 5 inches. Its weight is 3500 pounds. It is arranged to take in tensile specimens 8 inches or less with 25 per cent. elongation for 18-inch specimens, or more for shorter lengths. Round specimens, 1½ inches in diameter or less. Square specimens, 1½ inches square or less. Flat specimens, 2½ x 1 inch or less. Transverse specimens, 20 inches or less to 6 inches long. Compression specimens, 8 inches long or less. Compression surfaces, 6 inches in diameter. Motion of pulley head, 23 inches. There are four different speeds with which specimens can be tested, the maximum being 4 inches per minute and the minimum 1 inch in 10 minutes. There are two speeds for driving in opposite directions. Power is applied by levers for starting, stopping, reversing and also for changing the speeds.

The additions and changes to the Pumping Station of the Princeton Water Works, at Princeton, N. J., have been completed and the plant is in successful operation. The improvements were in charge of Frank C. Roberts, C. E., of Philadelphia.

Hardware.

The handle factory of L. C. Gleason, Fenton, Mich., was entirely consumed by fire January 15 with tools and stock. Mr. Gleason advises us that he will rebuild at once, making his factory very completely equipped with the most improved machinery for axe handles, of which he makes a specialty.

The new works now being constructed by the Reading Hardware Company, at Reading, Pa., will be ready for occupancy about March 1 next.

The Bryden Horse Shoe Company, of Catasauqua, Pa., have commenced making shoes in their new works, and when the plant is in full working order the capacity will be very largely increased. The business of the company is constantly increasing.

The Palmer Hardware Mfg. Company, Troy, N. Y., have purchased the effects of the Albany Hardware Mfg. Company, Albany, N. Y., consisting of patents, machinery, tools and stock, and are transferring the plant to their works in Troy, which transfer they state will not cause much interruption in the work, nor retard the filling of orders. The line consists of patented specialties well and favorably known to the trade, in which are included solid steel mining knives, ice tongs, ice picks, ice axes, sidewalk cleaners, transom lifters, &c.

Miscellaneous.

A charter has been granted to the Adams Coke-Oven Bottom Mfg. Company, of Pittsburgh, for the purpose of manufacturing coke-oven bottoms.

The United States Pipe Bending and Coiling Company, of Chicago, have been incorporated, with a capital of \$100,000. Incorporators, M. M. Jamieson, George W. M. Reed and William S. Morse.

New Factory.

The new buildings of S. L. Allen & Co., Philadelphia, for the accommodation of their increasing business, are intended to constitute an extensive plant, a model of its kind, having a capacity nearly treble that of their present works. They are situated in a very eligible site, being at the crossing for the New York branch (four track) of the Pennsylvania Railroad, passing on the North and the Bethlehem branch (two track) of the Reading railroad on the east. This is the only crossing of these two railroad systems on grade within the city limits. A handsome and substantial brick station is just being completed by the Pennsylvania Railroad Company, directly opposite the lot. Both railroads are, of course, available for sidings which can be run directly through the center of the lot lengthwise, a distance of over 500 feet. The whole plot contains over 2½ acres. The main building fronts on Glenwood avenue, is 176 feet long and 59 feet wide, and will be three stories high, and adjoining it on the west is the warehouse, 125 feet long by 43 feet wide, also three stories. These are so constructed as to carry a fourth complete floor in the future, if required; the planking of the floor to be put in position now, and the temporary roof to be constructed to rest directly upon it. The main building contains the stock rooms for castings, for malleables and for wrought steel parts; also the grinding and polishing rooms and the assembling, painting and packing departments. Each floor is connected directly with the warehouse floor. The forge building extends 250 feet in length along the Pennsylvania Railroad front; it is 46 feet wide, single story, with high lantern roof. The boiler and engine rooms are situated more centrally between the three buildings, and are 40 by 35 feet, and 45 by 35 feet respectively. Over the engine room will be the pattern and experimental rooms. Other small buildings for stocks of steel, paints, oils, &c., will be conveniently situated. The sidings will extend to supply conveniently the different departments and to ship the finished goods. The engine will be 125 horse-power, Green or Corliss pattern, and will

be constructed for the most recent and improved plan of rope driving; conduits beneath the level of the ground will furnish roomy accommodations for the ropes and the necessary tighteners, deflectors, &c., with space for passage from the engine room to the perpendicular shafts through which the power is conveyed to the different buildings. Suitable and convenient elevators, surface hand-car railways, overhead tracks and conveyers, with steam heating, electric lighting, &c., will combine to make an ideal plant for the purpose intended. The grinding and polishing machinery will be of special or improved patterns, with exhausts for dust, to make the life of the polisher more enduring. The forging shop will be supplied with special hammers, presses, forges, tempering apparatus, &c., of the most suitable patterns, and with devices for quick handling of stock, whether in bars or in finished parts, or in a partly completed state.

A Great Rail Record.

The South Chicago works of the North Chicago Rolling Mill Company have again broken the record in the production of Bessemer steel ingots and rails. In the 24 hours ending at 6 o'clock on Saturday morning, the 26th inst., their production was as follows:

Blast Furnace Department.			
			Tons.
Furnace No. 5, direct metal.....			197
" " 6, "			183
" " 7, "			216
" " 8, "			205
Total direct metal.....			801
Cupola metal.....			629
Total.....			1430

Bessemer Department.		
	Heats.	Tons of ingots.
Day turn.....	59	693
Night "	60	700
Total.....	119	1393

Rail Mill Department.		
Rolling for Union Pacific Railway, 75 pounds per yard:		
	Rails.	Tons.
Day turn.....	1838	611
Night "	1912	636
Total.....	3750	1247

The production for the month of January will be very heavy. It may seem singular that such extraordinary work should be done in these depressed times when orders for rails are not pressing, but it is in this way that expenses are reduced per ton of product in order to be able to sell for the low prices now ruling.

It has been suggested that a thorough search should be made in this country for a deposit of magnesite, suitable as a raw material for the lining of open-hearth furnaces for the basic process. We are informed that the cost of the foreign material is one of the principal objections in the way of the introduction of the basic process by at least one leading firm of steel makers. Until it is found a good deal of basic steel must be imported.

The total number of immigrants arriving in the United States from all countries save Mexico and Canada during 1888 is 518,518, against 510,058 the previous year.

Taking effect February 1 the following advanced freight rates from Pittsburgh will go into effect to Salt Lake City, Ogden and Utah common points: On classes 1, 2, 3, 4, 5 and A \$2.50, \$2.15, \$1.75, \$1.45, \$1.25, \$1.10. The present rates are \$2.05, \$1.80, \$1.55, \$1.30, \$1.15, \$1.05.

The Iron Age

New York, Thursday, January 31, 1889.

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF, JR., - EDITOR.
GEO. W. CORE, - - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS, - - HARDWARE EDITOR.
JOHN S. KING, - - - BUSINESS MANAGER.

Pig Iron Statistics.

Nearly two years since *The Iron Age* made a change in the method of collecting and presenting its monthly statistics of furnace capacity in blast, the principal aim being to estimate as closely as possible the actual rate at which pig iron was being produced in the country, and to show this on the first of each month. In this effort we have been favored with the kind co-operation of the great majority of the makers, though we may frankly acknowledge that a certain number do not respond. This, and the occasional delays naturally incident to gathering figures from so wide a territory have introduced elements of error, which are not serious, broadly speaking, but which are keenly felt by every painstaking statistician.

In the review accompanying his annual statistical report, James M. Swank, the Secretary of the American Iron and Steel Association, says: "The extraordinary activity of the furnaces in the last few months in the year brought the total production far above the figures indicated by the statistical results of the first half of the year and by subsequent unofficial statements." What Mr. Swank probably alluded to was the extraordinary estimate, apparently accepted by many, made in the middle of December by the *American Manufacturer*, which reached the conclusion, from its monthly blast furnace reports, that the 1888 production was a little less than 6,000,000 gross tons. In *The Iron Age* of January 10 we put the total output at 6,500,000 gross tons. The official statistics collected by Mr. Swank, just published, make the correct figure 6,490,739 gross tons, certainly a satisfactory showing, though the total was probably a surprise even to Mr. Swank, as his preliminary estimate did not nearly reach that figure.

But the great discrepancy in the estimate of our Pittsburgh contemporary appears in even a more serious light when it is considered that the error was concentrated on the second half of the year 1888, the official figures for the first half being known. On a production of 3,470,647 gross tons the *American Manufacturer* was 534,843 gross tons too low, its premature estimate having been 2,935,804 gross tons.

Let us inquire whether this grave error is possibly confined to any one of the three groups:

	American Manufacturers.	Am. I. & S. Ass'n.	Differ- ence.
Charcoal.....	247,925	246,206	38,281
Anthracite....	688,862	866,322	177,460
Coke.....	1,999,017	2,318,119	319,102
Totals....	2,935,804	3,470,647	534,843

If monthly capacity statistics can lead to so erroneous a result their value cannot be great. Our contemporary stated at the time: "This estimate is based upon

the capacities of furnaces in blast given in our monthly reports. Capacity, as is well known to all furnacemen, is a different thing from actual make, being somewhat in excess. What percentage must be deducted from reports of capacities to arrive at actual make, approximately, may be ascertained with a fair approach to accuracy by comparing what the make would be if capacities were made with what actual make is."

The *American Manufacturer* must be somewhat horrified to find that its "capacity" is a very different thing, indeed, from make; that it is not in excess of the latter, but that it calls for a generous plus factor of safety somewhere in the vicinity of 15 per cent.

By way of contrast we present below the results of the estimate of *The Iron Age*, based, as we frankly stated at the time, on partial, though fairly complete returns:

	The Iron Age.	Am. I. & S. Ass'n.	Differ- ence.
Anthracite....	866,303	866,322	+ 31,981
Coke.....	2,313,216	2,318,119	- 4,903
Totals.....	3,211,519	3,184,441	+ 27,078

We did not put forward any detailed estimate of the make of charcoal pig, but after a rough calculation of the data at hand placed it at 580,000 gross tons at least for the year, or about 282,000 tons for the second half. This, it will be observed, is about 4000 tons out of the way.

The point which we wish to emphasize, however, is that the readers of *The Iron Age* may use its monthly blast furnace reports to estimate, as closely as necessary for all practical purposes, not alone the total output of pig iron, but also the make of single districts and States, without applying any arbitrary factors whatever. Such a computation of the 1888 product of coke and anthracite pig, made on the basis of the monthly figures of *The Iron Age*, shows the following, comparing them with the official returns:

	The Iron Age.	Am. I. & S. Ass'n.	Differ- ence.
Anthracite....	1,701,431	1,680,115	+ 71,716
Coke.....	4,187,110	4,236,705	- 49,595
Totals.....	5,888,541	5,916,820	+ 22,121

We desire to call particular attention to this, because these reports, to be of any service at all, should be useful to the trade. The figures submitted in our January statement furnish an excellent illustration of the direct deductions which can be drawn from such data. We stated then that we were producing at the rate of over 7,500,000 gross tons annually, a rate which was clearly excessive. In fact, including charcoal pig, the rate was close to 7,720,000 tons, or considerably over 1,000,000 tons more than was made in 1888. These reports possess the great value which a prompt revelation of the facts has to all concerned in this great industry. They showed at that time the necessity of caution, and foreshadowed the turn in the markets which has since come.

Mr. Walter C. English, for a number of years connected with the business department of *The Iron Age*, has been placed in charge as manager of the Boston office, which we have just opened at 149 Congress street. Mr. English, who is widely known to our patrons in the New England States, deserves the confidence and support which we bespeak for him.

The Samoa Trouble.

The Samoan difficulty is rapidly becoming critical, the amicable relations heretofore existing between the United States and Germany being seriously menaced. The indications serve to confirm a belief that it is the settled determination of Germany to establish her authority as a dominating influence in the islands, and this in disregard of existing treaties between the United States and Samoa, one formally concluded in 1878, when Wm. M. Evarts was Secretary of State, and a prior treaty negotiated by Commander Meade, U. S. N., in the year 1872, signed by all the Samoan chiefs, expressly ceding the United States Government certain exclusive rights and privileges, including a permanent coaling station at Pago Pago harbor. Touching the question of intervention, the treaty of 1878 stipulates that, should differences arise between the Samoan Government and any other country, the United States would "employ its good offices for the purpose of adjusting those differences." This pledge is the extent of the obligations assumed. The German authorities apparently ignore the existence of these treaties, or at least practically deny their validity. Americans in Samoa represent that on various occasions they have been treated with gross indignity and that the flag has been outraged.

An emergency of an extraordinary character was precipitated a few weeks ago, when King Malietoa was enticed on board a foreign man-of-war and sent into captivity. Much bloodshed ensued, a number of Germans who disembarked from a naval vessel being among the victims. Bismarck's organ at Berlin vindicates German conduct and pretensions in this matter, and, furthermore, repudiates any claim that may be set up as an impediment to the ascendancy in Samoa of the German flag. In consequence of these events the authorities at Washington are constrained to take immediate action. Five United States vessels will soon be concentrated in Samoan waters, and Senator Sherman, who is supposed to reflect the views of the incoming Administration, calls for an appropriation of \$500,000 to be immediately available for the protection and improvement of the coal station at Pago Pago harbor. The possession of this harbor is regarded by Senator Edmunds as an object of primary importance. During the past week he authorized a statement to this effect: "The Samoan Islands are on the highway of commerce across the Pacific Ocean, and are of great importance with relation to the development of the trade via the projected canals across the Isthmus of Panama and across Nicaragua. To a power whose ships are sent on long cruises the establishment of coaling stations is a necessity, and the location of one on the central island of the Samoan group, as provided for in the proposed amendment to the Diplomatic and Consular Appropriation bill, reported by the Committee on Foreign Relations, is looked upon as one of great importance to us." As both Senators Sherman and Edmunds are assumed to speak advisedly, it would appear to be the fixed determination of the Washington authorities to vindicate the rights and interests of the United States in Samoa, whatever they may be.

The situation may become critical. Congressman Thomas, of Illinois, an active member of the Naval Committee, would insist upon the *status quo* as it existed before the expatriation of King Malietoa. Moreover, Admiral Kimberly, commanding the flagship Trenton, is recognized as an officer who will shrink from no known duty, and yet one who will act with calmness and discretion. The American people, not unmindful of the high character of the German nation, will cherish a firm belief that international difficulties, however serious, can be adjusted by some other means than hostile collision. At the same time it is evident that exasperation on either side may proceed to a point where ordinary considerations of prudence and expediency may be lost to view under the pressure of an overwhelming public sentiment.

In the present situation two facts of deep significance come into view: The case as affecting Germany is the war specter hovering in the horizon of French politics, with which is associated the name of Boulanger. Of another character, not less practical as concerns the United States, is the popular conviction, now gaining strength as never before, that many millions of money must be devoted to building up the national defenses and naval armaments.

Railroad Demurrage Charges at Chicago.

The mercantile and manufacturing interests of Chicago have been considerably stirred up of late by the imposition of demurrage charges by the railroad companies. These companies organized a car service association in September last for the purpose of enforcing a uniform regulation imposing a charge of \$1 per day on each car remaining unloaded after the expiration of 48 hours. As a very large amount of freight was being moved at that time, and the business of the railroads would have been embarrassed but for a regulation of this character, it was accepted by shippers generally without much protest. Now, however, the heavy movement of freight is ended, the demand for cars is not so pressing, and shippers are of the opinion that the rules should be relaxed, if not entirely suspended. Some of them, indeed, contend that demurrage charges by railroad companies are illegal, and have carried the question into the courts.

On the 23d inst. a case of this character was tried before a Chicago justice. A railroad company had refused to permit some coal cars to be unloaded until demurrage charges were paid, and the consignees had secured a writ of replevin against the company for the coal. The attorney for the consignees cited cases to show that a railroad had no right to make demurrage charges under any circumstances, as such charges were confined to maritime business, and could only be established by provision in the bill of lading. On the other hand, the railroad company's attorney cited decisions holding that carriers could charge a reasonable amount for demurrage, although the bill of lading did not provide for it. To prove that \$1 per day was a reasonable charge, some nice calculations were submitted, showing that on the basis of the cost of the yard-space

used for the discharge of freight, a single car would occupy room on which interest at 6 per cent. per annum amounted to 77 cents for each working day, while the average daily earnings of the cars was 98 cents when they were in actual use in the transportation of freight. Unfortunately the case was complicated so that it could not be decided on the simple issue of the legality of demurrage charges, and the justice decided against the railroad company on the ground that they should have let the coal firm take their coal and brought suit for the demurrage if payment had been refused. An appeal will be taken, and probably the upper courts will pass upon the important legal question involved.

It is altogether probable that other cases arising under the enforcement of the demurrage regulation will soon be brought up in the courts. Abuses are charged against the railroad companies, which, if true and duly proved, will place them in a very unsatisfactory position in the present state of public sentiment. It is alleged that the companies have been so eager to farm this new source of revenue that even when a car has been accidentally shifted from its proper place before it was unloaded, and several days elapsed until the mistake was ascertained and the car returned, the consignee has been obliged to pay demurrage for the entire time, notwithstanding the fact that he did not know and had no means of ascertaining the whereabouts of the car in the meantime. Numerous instances are reported of consignees being unable to get to their cars to unload them, because they were hemmed in by other cars, until after the expiration of the 48 hours of grace, but the charge for demurrage was imposed promptly, without regard to the circumstances. The protests of suffering Chicago business men have been disregarded to such an extent that it is not at all remarkable that they are now beginning to kick vigorously.

As usual, the small shippers are handled more arbitrarily than the larger ones. Those who receive but a few carloads at a time, which are discharged in the company's yards, are obliged to pay demurrage charges before they can take their goods. Large shippers, who have their own sidings and whose movements are not directly controlled by yardmasters and freight agents, unload the cars consigned to them and lay bills for demurrage to one side to await negotiations. Small shippers pay the charges, and do not sue to recover them, because the cost of litigation would far exceed the amount in question. Large shippers will probably have such an accumulation of bills in time that they can afford to dispute the legality of the charge for demurrage, if the system is not changed.

In considering this matter the fact cannot be overlooked that the railroad companies have good ground for the position they have taken, although they have unquestionably made the time allowed for unloading too short, and have permitted the subordinate officials to introduce abuses which should by no means be countenanced. Quite a considerable class of business men receive coal and other merchandise on consignment, maintain no storage yards or warehouses, and trust to their selling ability to enable them to dis-

pose of such consignments by the time they arrive at their destination. A glut of such merchandise, however, will cause an accumulation of loaded cars that will in a short time fill a railroad company's spare tracks. Such cars have been known to stand for a month or more without being unloaded. Foundrymen have received coke and used the car in which it came for a coke-house until it was gradually emptied, when it was replaced by another full car, which was used in the same way. Some regulation was evidently needed to correct such transformations of rolling stock into store-houses, but not regulations which work hardship all round. The Chicago merchants and manufacturers also believe that they are unjustly discriminated against, as this rule does not apply generally at railroad centers throughout the country. If this is really the case, and shippers at other points are allowed great latitude, the people of Chicago are unjustly treated, and it is no wonder that they protest. Chicago is too important a trade center now for such discrimination.

The Progress of Paraguay.

The war of 1865-1870 between Paraguay on the one hand and Brazil and the Argentine Republic on the other reduced the Paraguayan male population by one-half, 170,000 men perishing by the sword and disease, while 50,000 women and children died from famine and exposure. Gradually the equilibrium between the two sexes has been a little restored, there being at present 130,000 males and 170,000 females, without counting an Indian population, half civilized and wild, of 180,000. Short of hands as the country was, and utterly ruined, recovery from such a blow has been slow, but the fertile soil and fine climate, and the many resources, at length begin to attract immigration of a desirable kind from Europe, stimulated by a free passage and liberal land grants to settlers. To the native population of 430,000, inclusive of Indians, some 10,000 foreign settlers have thus been added and two flourishing colonies founded, San Bernardino and Villa Hayes, named after the American ex-president. German immigration now increases rapidly.

Paraguay is well watered by the Pilcomayo, Paraguay and Paraná rivers, the latter, jointly with the Uruguay, forming the Rio de la Plata flowing into the Atlantic between Buenos Ayres and Montevideo. Although an inland country, Paraguay has thus easy and rapid access to the sea. The capital is Asuncion, with a population of 30,000, and there are a dozen other cities with populations ranging between 5000 and 15,000. The finances are prosperous, the income, including land sales to the amount of \$329,146, being \$1,938,176 in 1887, and the outlay \$1,400,503. In the same year the home debt was reduced to \$1,068,250, \$398,500 having been paid back out of the surplus revenue, while the foreign debt was consolidated into \$4,250,000 2 per cent. bonds, to carry 3 per cent. dating from January 1, 1892, and 4 per cent. from January 1, 1897. The Government owns most valuable lands which it sells on very liberal terms to land companies and *bona fide* settlers; it is furthermore the owner of extensive, valuable so-called "yerbales" or forests, in which the

famous Paraguay tea, "yerba mate," grows spontaneously and abundantly—a tea consumed all the way to the northern provinces of Brazil. It also owns \$500,000 shares of the National Bank, which has a stock capital of \$1,500,000, paying 10 per cent. dividend, and commanding 10 per cent. above par, although only 50 per cent. has been paid in.

The army has been reduced to 628 men file; in the event of war the militia—which is quite numerous—is enrolled. The navy consists of three steamers, two of which are mere revenue cutters. There are 152 km. of railway in running order, and—besides the telegraph wires running parallel therewith—72 km. of line connecting the republic with the world's cable system at Paso de la Patria.

European and Argentine capital is flowing freely into the country. A company, represented by H. A. J. Baiz, has been formed in Amsterdam, under concessions from the Paraguayan Government, for the purpose of tobacco planting on a large scale. The lands have been secured, and quite a number of privileges with them, among others exemption from the tobacco tax. Tobacco grown in Paraguay compares favorably with Sumatra and Manila. The Paraguay Land Company are about to build a railroad from Villa Hayes, near the capital, to Puerto Margarinos on the Pilcomayo River, in Bolivia, a distance of 600 km. At Buenos Ayres the Paraguayo-Argentine General Trading Company have been formed with a capital of \$5,000,000, with a branch concern at Asuncion, chiefly for the purpose of doing a banking business, and the issue of hypothecary cédulas. Three of the managers are appointed by the Government of Paraguay.

At the time the foreign debt was consolidated the bondholders received as part compensation 500 square leagues of public lands, and a land company is now to be formed to utilize this valuable possession, in connection with an agricultural bank with a capital of \$8,000,000. The import increased from \$1,805,741 in 1886 to \$2,221,750 in 1887, and the export from \$1,620,779 to \$1,715,853. The arrivals at Buenos Ayres and Montevideo in 1886 were 320 vessels with cargoes for Paraguay, of 60,408 tons, 223 thereof being steamers, while river navigation carried entries of 343 craft, with 12,239 tons. The export in 1886 consisted chiefly of tobacco, 5306 tons; yerba mate, 4508 tons; oranges, 25,000,000; cabinet wood, 151,281 cubic yards measurement, and 81,000 hides.

Trouble is brewing just at present between Paraguay and Bolivia, the latter having just emerged from a revolution, and a frontier dispute having arisen between these neighbors. Brazil sent to Matto Grosso, bordering on Bolivia, a military expedition under Marshal Fonseca, on December 27, in order to watch events, as matters look threatening. It would be deplorable to see Paraguay, now on the high road to prosperity, engage in a prolonged border war. Paraguay claims the Bahia Negra district, and is dispatching reinforcements to Puerto Pacheco. Bolivia looks upon an outlet on the Paraguay as a necessity of the Republic, national and commercial life, and Puerto Pacheco—lying 7 feet above the highest inundations—is the only naturally available place for a port on the west side of the Paraguay

River. These events coincide with the formation of an American river navigation company for placing a line of steamers between Campana and Asuncion on the Paraná River. Intelligence as to whether peace is to be preserved in that region or not is consequently expected with some anxiety, not only in South America and Europe, but quite as much in this country.

American Pig Iron Warrants.

For some months past a movement has been progressing, under the direct initiative of George H. Hull, of Louisville, Ky. Rumor has seized upon vague hints of the negotiations progressing, magnifying them into some great trust, with special reference to Southern iron interests. As a matter of fact, the undertaking proposes simply the establishment on a sound basis, worthy of confidence, of a company which will undertake the issue of pig iron warrants, a readily negotiable security, against pig iron stored, under certain conditions, at a number of points, broadly on the lines of the great warehouse concerns in Great Britain. The American Pig Iron Storage Warrant Company, whose capital of now \$2,000,000 has been subscribed, has taken the first steps toward carrying out this plan. A considerable number of pig iron producers have entered into contracts with the company, others have promised their support or expressed their general approval of the system. It is stated that these represent an annual capacity of about one million tons. Negotiations, only recently begun in this direction, are still in progress, the principal work accomplished being the creation of the necessary support of influential interests as stockholders.

THE STOCKHOLDERS.

The *personnel* of those who have taken an interest in the American Pig Iron Storage Warrant Company is well calculated to command attention and confidence. The officers of the company are:

President: George H. Hull, the originator of the enterprise, a well-known iron merchant of Louisville.

Vice-president: George F. Tyler, of Philadelphia, a retired capitalist, interested in a number of furnace and coal companies, and prominently identified with the now famous Pocahontas Land Trust.

Treasurer: Logan C. Murray, of New York, who is president of the United States National Bank.

The executive committee consists of the following, in addition to the officers named:

William Libbey, chairman, of New York, a former partner of A. T. Stewart, and identified as a director with a number of large enterprises like the Erie Railroad and the United States Trust Company.

Thomas Rutter, of New York, who is connected with the Consolidated Gas Company, and the Louisville and Nashville Railroad.

George T. Barns, of Philadelphia, prominent in the iron trade of that city.

Samuel R. Shipley, of Philadelphia.

Among the other stockholders are: J. H. Inman, of Inman, Swann & Co., cotton merchants, who are connected with a good many Southern railroad, coal and iron interests, being identified with the Richmond Terminal Company.

Eckstein Norton, president of the Louisville and Nashville Railroad.

H. O. Armour, brother of P. Armour, and New York representative of Armour & Co., of Chicago.

G. Philler and Morton McMichael, of Philadelphia, president and cashier respectively of the first national bank formed

under the Chase law, the First National Bank of Philadelphia.

G. S. Coe, of New York, the veteran president of the American Exchange National Bank.

S. A. Caldwell, of the Fidelity Trust Company, of Philadelphia, the first trust company organized in the United States.

S. R. Shipley and T. Wistar Brown, president and cashier respectively of the Provident Life and Trust Company, of Philadelphia, the company itself also being a stockholder.

S. T. Tyler, of Philadelphia, president of the Fourth Street National Bank and receiver of the Shenandoah Valley Railroad.

Jay O. Moss, of New York, president of the Columbus and Hocking Coal and Iron Company, and secretary and treasurer of the Cotton Seed Oil Trust.

A. Heckscher, of Philadelphia, prominently identified with Pennsylvania industrial interests.

J. C. Bullitt, of Philadelphia, and John J. McCook, of New York, leading lawyers of both cities.

Drexel, Morgan & Co., of New York, and Drexel & Co., of Philadelphia, the well-known bankers.

J. D. Probst, of New York, banker.

W. P. Thompson, of New York, vice-president and active business manager of the Standard Oil Company.

S. Neustadt, of Halgarten & Co., bankers, New York.

Gen. Samuel Thomas, of the East Tennessee, Virginia and Georgia Railroad and other railroad and industrial interests.

George H. Seeley, of New York, president of the Ivanhoe Furnace Company, of Virginia.

J. H. Flagler, of New York, president of the Cotton Seed Oil Trust and of the National Tube Company.

W. R. Hart & Co., leading Philadelphia iron merchants.

Samuel Dickson, of the Crane, Dunbar and a number of other furnace companies.

G. W. Troutman and T. Kitchen, of Philadelphia, president and cashier, respectively, of the Central National Bank of that city.

Henry McCormick, of Harrisburg, the well-known iron manufacturer of that place.

Luther S. Bent, of Steelton, the general manager of the Pennsylvania Steel Company.

Enoch Ensley, of Memphis, Tenn., prominently identified with a large number of Southern enterprises.

Naylor & Co., of New York, the largest iron and steel importers.

H. Wickham, of Philadelphia, president of the Southwest Virginia Improvement Company.

E. B. Leisenring, of Mauch Chunk, identified with large anthracite, coke and coal interests in Pennsylvania and in the South.

We have dwelt upon the *personnel* of the company because it proves a backing which places it in a position where it commands the serious attention of the iron trade, where every producer must thoroughly investigate the question whether or not the scheme is one in which he must co-operate, where every commission merchant must consider to what extent the new methods of business impending are likely to influence his interests.

THE PLANS OF THE COMPANY.

We present below the points brought out in favor of the system proposed, printed in a pamphlet, a few copies of which were privately circulated some time since. We may preface it with the following data:

The company proposes to establish storage yards, first at the furnaces, called primary storage yards, on land leased at a nominal rental from the furnace companies, who

propose to store in it, fence it in, put in tracks, &c. The company makes contracts with furnace companies for a period of years, the obligation entered into by the furnace being that it will not place any iron, against which warrants are to be issued, into the hands of any other warrant company. The producer is at liberty to store any part or none of his make in the yards. For what he does store in it he pays a yardage of 25 cents a ton and 2 cents per ton per month carrying charges. In consideration of these payments the storage company acts as responsible custodian of the iron. To the consumer it guarantees the grading, which is checked by experts. It issues warrants signed by the warrant company and registered by a trust company in New York. The warrants call for 100 tons of pig iron of a specified brand and grade, delivered free on board cars in the yard named in the warrant.

The charges are relatively low, the cost of carrying pig iron a year being 49 cents. In England the yardage charge is 50 cents a ton and a monthly storage charge of about 2 cents a ton.

A result of the introduction on a large scale of the storage warrants is likely to be considerable speculative interest in pig iron. It is probable that the warrants will be listed in the leading exchanges.

The plans of the company contemplate ultimately, as the business develops, to establish "secondary" storage yards at the leading points of consumption, such as New York, Philadelphia, Chicago and other great centers.

THE ARGUMENT.

The following is put forward by the promoters of the company:

Pig iron is the most important of all crude materials that enter into the commerce and manufactures of the country, and it is conceded upon all sides that no other article has such a controlling and disturbing influence on general business, and yet no effort has been made to control its violent fluctuations.

Anthracite pig iron was \$18.75 per ton in Philadelphia in August, 1861, and \$73.62½ in August, 1864. It was \$30.50 in January, 1871, and \$53.87½ in September, 1872. It was \$16.50 in November, 1878, and \$41 in February, 1880. In the Western markets iron reached \$80 per ton in 1864, and, after declining to less than half that price, reached \$59 in 1872. Forge irons, which sold for \$40 in 1880 in the West, declined to \$13 in 1884, advanced to \$20 in 1885, and are now down to \$18 again in the same markets. The causes of these great fluctuations in price are:

1st. The small stock of pig iron carried in the United States.

2d. The great length of time and enormous amount of money required to increase the production, when the return of a prosperous condition of business demands it.

It takes a year or more to organize and build a furnace, and a furnace capacity great enough to supply the country in prosperous times would be double enough to supply it in dull times. The remedy, therefore, cannot come through the increase in furnace plants. The only safe and practicable remedy is in the carriage of large stocks of pig iron, probably equal to the production of one or two years. Last year the United States produced 6,417,148 gross tons of pig iron, and imported 1,997,241 tons of iron and steel. The stock of pig iron on hand December 31, 1887, was 338,142 tons, less than three weeks' production, and but a trifle over two weeks' consumption, which is about the normal condition of affairs. These great fluctuations in price must continue as long as such small stocks of pig iron are

held. Small stocks will be held until some comprehensive system is inaugurated that will transfer the financial carriage of pig iron by certificates or warrants to financial centers, and at the same time leave the actual stock at the point of production, where it can be stored at a nominal cost, and, at the same time, where it can be transported, when needed, to any of the markets naturally tributary to that district.

The Standard Oil Company was organized in 1870. During the nine years before its organization oil ranged in prices between 52 cents and \$7.85 per barrel at the wells, a fluctuation of \$7.33 on a minimum price of 52 cents. For the last nine years prices have ranged from 67 cents to \$1.06 a barrel, a total fluctuation of 32 cents on a minimum price of 67 cents. Before the Standard organization, the largest stock ever carried was 534,000 barrels. During the last nine years the country has carried an average stock of 28,055,662 barrels, and during three years of this time the stock has averaged over 35,000,000 barrels. The small stock carried before the organization was done with great difficulty, the oil business was hazardous and attended with frequent failure; the large stock carried since the organization has been done with ease, and the business has been stable and profitable.

This is exactly the nature of the relief needed by the pig iron business, and a like result will follow the inauguration of such relief. There are not as many obstacles to the carriage of large stocks of pig iron as there are to the carriage of oil or grain. In the place of expensive elevators, tanks and pipe lines, which are subject to damage by fire and many other disturbing causes, pig-iron storage requires only a simple fence in the open air; and there are absolutely no risks of loss from fire, mold, leakage or deterioration in quantity or quality of the iron so stored, yet the United States carries but three weeks' production of iron, against about 12 or 18 months' production of grain and oil.

Elevators and pipe lines are not only profitable to their owners, but have grown to be a necessity to the producer, and money flows to their certificates of property, both as collateral and as a speculative commodity. Storage yards for the physical carriage of iron, and certificates or warrants representing the property in a form readily transferable, and giving absolute security to the holder, thus facilitating, with profit and advantage to all concerned, financial carriage, are the greatest commercial needs of the present day.

As a collateral security for loans no other article is as safe as pig iron, and no other article presents as little opportunity for fraud or loss in its handling. It cannot be injured by fire or flood; it is not affected in quality or weight by years of exposure to the weather. No appreciable amount can be stolen without detection. It requires no insurance. A mob cannot destroy or injure it, and even the destruction of the Government, which would leave valueless the bond that we now regard as the best of all securities, would not injure the ultimate value of a stock of pig iron. There is hardly a bank in Great Britain that does not carry pig iron warrants, which are there regarded as the safest of securities, and if issued here as abroad, by one company of known responsibility, they will soon be regarded here as the safest of all securities for collateral or investment. The large fluctuations in the price of pig iron during the last 50 years would have been even greater if we had not had the stocks of Great Britain to fall back upon in time of need. The foreign stocks consequently will not hereafter be the element of safety that they were when Great Britain made two or three times as much iron as America. Every material increase in the building of railroads is checked by the

enormous advances in iron, and most of the new mileage is laid at a cost of two or three times the normal price of iron. As a consequence, capital becomes frightened, railroad building stops, iron goes unnaturally low, in place of the unnaturally high prices of a few months before; this is always followed by general business depression, and it takes three, four or five years for the country to recover from the result. In fact, it is not until after many of the furnaces have gone through bankruptcy and stopped, and this process of ruin has gone so far that even the small consumption exceeds the production, that the turn comes. Then another enormous advance takes place, and the same process is repeated over another cycle of years. All commodities share more or less in these fluctuations, but iron is the primary and controlling cause.

A comprehensive organization that would make possible the cheap and safe carriage of pig iron would speedily result in the ability to carry several millions of tons with ease; would change the business from one of hazard and frequent failure to one of stability and uniform profit. The large stocks would not only be needed in prosperous times, but would prevent the enormous and unnatural advances in such times, and the facilities for carrying stocks would prevent the ruinous decline occasioned by our present inability to carry them. Some furnaces can afford to, and do, carry many months' production, but others are not able to carry a week's make, and must sell their iron as made. If the market will not take it at one price, it is forced off at a reduction, and the market goes tumbling down in consequence. The strong furnaces do not, therefore, get the full benefit of their ability to hold, but when they do sell must take the prices made by the necessities of the weak ones.

Some system that will enable the weak furnaces to store their iron, and realize money on it, will be of as much advantage to the strong as to the weak. Capital will absorb the warrants just as soon as they are made safe, and just as fast as they are created. We will very soon have a stock of one or two years' make of pig iron, which will be carried with perfect ease.

As the business of the country grows, means must be created to facilitate and handle it, yet up to the present time no means have been devised for adequately handling pig iron, the most important and controlling commodity, while less important interests have been intelligently and successfully provided for. Only a few years ago the country suffered in consequence of the inability of many railroads to provide sufficient cars to handle their freight, and out of this necessity grew car-trust certificates. At first these certificates were regarded with suspicion by both the car manufacturing companies and capitalists. There were few States in the Union whose laws made them a safe investment, but, by a little effort the laws were amended, the business was systematized, and to-day capital readily absorbs them, and the whole business of the country is relieved by the facility with which needy roads can supply themselves with the equipment to do their business.

For years every pig iron agent has been importuned over and over again to know if money could not be borrowed on iron at the furnaces. Occasionally efforts have been made to afford relief, but generally with dissatisfaction and sometimes with disaster; often in litigation to protect the loaner's rights if the iron remained in the hands of the furnace, and in heavy freights and expenses if it was moved and stored at other points.

Warehouse receipts or warrants will not be largely taken as a collateral or negotiable security as long as the property is in the possession of the borrower or producer,

and at the same time the bulk and weight of pig iron are economical obstacles to its movement from the place of its production until needed for consumption.

A storage company should be organized whose signature and seal to a warrant would give that warrant unquestioned standing in all financial centers, and yet a company whose only aim is to create a desirable collateral, and secure loans on same, will fall far short of the commercial need of the present time; a dozen such companies would not meet the demand of the hour. In fact, the needed benefit would be delayed, if not defeated, by a multiplicity of such companies.

Great business advances can only be accomplished through great organizations. Within a very few years the iron and steel product of the United States has increased from 1,000,000 to 10,000,000 tons; great improvements have been made in the modes of manufacturing, while the commercial modes of handling same are almost as crude, expensive and cumbersome as when the product did not exceed 1,000,000 tons. Such storage companies as have existed and do exist have done nothing toward improving the methods of handling and selling iron, and it is not believed that the desired benefits and improvements can be accomplished except through the organization of one powerful company for this express purpose, with which the whole furnace interest of the country will co-operate with confidence, and which will use its power and influence for the advancement and improvement of the interest that it depends upon for its growth.

This company should not only be powerful enough in the names and wealth of its organizers to control vast capital, but through its stockholders should be so allied with other large and active commercial interests as to insure the successful establishment of any economies and improved methods it might inaugurate in the handling and sale of pig iron.

The present cost of selling iron on commission, with some exceptions, is from 35 to 50 cents per ton. This is a severe tax on the profits of the furnace company, and at the same time only a reasonable return to the merchant, on account of the expensive and cumbersome way in which the business is now necessarily done.

It is believed that with the success of a National Pig Iron Storage Association will come the organization of metal exchanges in the important iron consuming centers, and that iron will soon be marketed at an expense not to exceed 5 cents per ton to the producer, and at the same time be much more profitable to the merchant, on account of the great increase in the actual tonnage in sales and the diminution of business expense in handling certificates in place of the actual property.

The sale of oil certificates in the New York Board alone is from 100 to 150 times as great as the actual product of the whole country. A commission of 5 cents per ton to the merchant or broker on iron sales by certificate or warrant will yield a much larger revenue than the present system.

There is no obstacle to the practical carrying out of this plan. Its success is believed to be insured in advance, from the certain benefit it offers to every branch of business that it depends on for its growth.

The regulation of the discrepancies in grades and weights of iron will not be as difficult to accomplish as they were with flour, wheat, oil, &c., and the difference in the chemical quality of iron made by the different furnaces can easily be provided for by naming the brand on each warrant. Such facilities are more urgently needed for pig iron than for oil, grain or any other commodity, and if properly con-

ducted would excel them in usefulness. Capital would soon seek and prefer this security, on account of its visible, stable and indestructible character; the interest rates on the same would soon be among the lowest, and it would absorb the speculative capital of the country more largely than almost any other commodity.

The company should acquire ground sufficient for a storage yard at the various furnaces by long lease, so as to have actual physical and legal possession of the iron stored. This company should be elastic enough in its organization to permit of its expansion to national proportions and with rapidity, as the demands upon it would be great as soon as understood. Secondary yards should ultimately be established at the principal points of consumption, to which sufficient stocks of iron can be moved, particularly in times of low freights. Warrants should be issued as iron is stored, which would guarantee weight, grade and brand of iron, deliverable at the primary yard on return of the warrant, or equivalent delivery at secondary yards on reasonable notice. But the establishment of the secondary yards should not be attempted until after the sale of iron by warrant has been adopted.

The primary yards at furnaces should be a part or continuation of their present yards, so that iron could be stored in the storage company's yard from the pig bed without any addition to the expense of handling. The expense of loading on cars from storage company's yard when shipped would be the same, and no addition to the present expense of loading from furnace yard—in fact, any plan that involved an extra handling of the iron would not be admissible, the storage company would be a permanent success only on the basis of its being a benefit and saving to the furnace companies.

At the present time pig iron is sold largely on four and six months' time, and even when sold for cash a period of from 30 to 60 days usually elapses between the shipment and actual payment for the iron. Iron sold by warrant is paid for on delivery of the warrant. It is believed that this storage facility is so much needed that it will grow rapidly, as soon as understood, and that iron will not only soon be sold by warrant, in place of the present slow, risky, expensive and cumbersome manner, but that the saving to the furnace in the delay and risk on even their cash sales over the present custom will alone pay the storage fee of the company, leaving as a clear gain to the furnace companies all the advantages and savings in commissions, risks, freight and other economies that might be brought about through the efforts and experience of as comprehensive an organization as is proposed.

The furnace business has for years been suffering for the want of some such organization, and in the absence of the needed relief have devised various plans to save commissions and correct existing irregularities; but in many cases these efforts have not been successful. Most furnace companies object to the present custom of selling for long future deliveries, but are compelled to so sell to insure prompt disposition of their iron as made; under the proposed system, furnaces can abandon the one-sided system of the future delivery sales as soon as there is an assured daily sale on exchange boards. As the heavy purchases for future delivery are made on the eve of anticipated advances, the furnaces rarely get much benefit from the unnatural high prices, as the reaction sometimes comes before they have filled their old sales. On the other hand, however, furnaces are apt to get the full disadvantage of the unnatural low prices, as consumers rarely buy for future delivery while the tendency of prices is down or stationary. Any system, therefore, that will prevent

the unnatural fluctuation in iron will be of great benefit to the furnaces, and large stocks will alone accomplish this end. It is not expected that the needed accumulation of stock will result from the amount of iron that will be stored to secure advances. As soon as a sufficient number of warrants have come into existence to justify their sale on metal exchanges, it is expected that the furnace companies will then store the bulk of their iron, because it will be the simplest and cheapest way of disposing of it, whether it is taken for consumption or speculation. The small amount of speculation directed toward pig iron in the past has had the effect of increasing its great fluctuations, while a large and systematic dealing by speculation would have the effect of confining the fluctuations to reasonable and natural figures, as has been the case with oil and other commodities that have been intelligently provided for. There may be opposition to such an organization and the changes it aims to bring about, as there have been to every movement to facilitate business, but all well-directed innovations that have had for their foundation the regulation of inequalities and saving of expense and time have been of permanent success.

The Stove Association.

The annual meeting of the National Association of Stove Manufacturers occurs in Chicago on the first Wednesday in February. To this meeting not only are the members of the association invited, but also stove manufacturers in general. It will be the eighteenth annual convention of the association, and is expected to be one of the most interesting and profitable meetings ever held. The headquarters are to be the Palmer House, and ample arrangements have been made for the accommodation of members and friends. The proceedings open at 11 a. m. of the day named. The subjects which are to be brought before the meeting through reports of committees appointed by the president are: 1, Revised Constitution for the Association; 2, Co-operation Among Stove Manufacturers; 3, The Method of Ascertaining Costs; 4, The Permanence of a Paid Secretary; 5, Overproduction; 6, Prices for 1889; 7, Traveling Salesman; 8, Consolidation or Trusts; 9, A New Bankrupt Law; and, 10, The Apprentice System. In a notice of the meeting issued by the secretary, D. M. Thomas, all these subjects are prominently set forth. The following is the substance of a circular letter issued to the trade by Mr. George H. Barbour, president of the association:

An earnest desire to carefully protect the interests of our organization, and to ascertain the real condition of business as it exists to-day, which appears anything but satisfactory, leads me to request that each manufacturer strenuously endeavor to ascertain for himself and communicate to me the cause of the existing depression. It may be truly said that to discover the evil is much less difficult than to prescribe the remedy, but as correct ideas must necessarily precede successful action, compliance with my request and the intelligent co-operation of members of our craft will supply such a fund of information as will prove an invaluable aid in determining our future course.

The annual meeting of the association occurs at Chicago on the first Wednesday in February. To this every stove manufacturer, whether member or not, will be invited. The usual notice will be given by the secretary. It is of the utmost importance that there be a numerous attendance; indeed, I hope for the largest representation we have ever had. The subjects to be discussed are of great interest, es

pecially those upon which the committees have been at work since the Pittsburgh convention, such as the "Cost Formula," the "Revised Constitution," the "Bankrupt Law," &c. We are all affected by these, more or less, and they cannot be too thoroughly considered.

Let us come to this convention prepared to give careful attention to every subject introduced, not acting as though our organization were valueless because it does not palpably accomplish all that we think it should. No one can really know all that it does effect, or how great its actual value is, as a large part of its influence and much of its work is indirect and unseen; but there can be no doubt that were it dissolved it would be very sadly missed, and great injury to the trade result in less than a year's time. I therefore urge that every member and each of those invited should attend the convention and take such part in the discussions as he feels competent to do, thus advancing his individual interests by promoting the general interest of the trade.

I invite you, whether a member of the organization or not, to correspond with me between now and the date of the convention, communicating fully and freely your views upon all trade topics. Such a correspondence cannot but open up new lines of thought and enable me to formulate plans and offer suggestions valuable to all concerned. A free interchange of opinions and suggestions is always productive of beneficial action, and our trade really needs all the stimulation that can be given it. Particularly valuable and correspondingly prized will be communications from and correspondence with the smaller stove founders, especially such as have not usually visited our conventions and whom I do not have the opportunity of meeting personally; their experience, needs and wishes will have my most careful attention, and it will be a great pleasure and afford me considerable satisfaction if I can aid in conserving their interests; no effort on my part to this end will be wanting.

David Wetmore, the well-known iron merchant and friend of the public school system, died at his residence, 119 Lexington avenue, Thursday afternoon. The immediate cause of his death was paralysis, but he had been ailing ever since Christmas Day, 1884, when he was run over and severely hurt by a wagon near his home. Mr. Wetmore was born in Liberty street, this city, December 31, 1823, and when a very young man entered the firm of Wetmore & Co., one of the oldest houses in the iron trade, in which his uncle, the late A. R. Wetmore, was senior partner. He was made a School Commissioner by Mayor Havemeyer, and served in the Board of Education for 13 years, during the greater part of which he was chairman of the Nautical School Committee.

The first steel postal car ever constructed has just been finished at the railway shops at New Albany by the American Fire-Proof Steel Car Company. It is built of plates of steel, lined with asbestos, and is admirably braced by means of steel rods running the entire length of the car, the rods being fastened by an ingenious device into the steel posts. The floors are of steel, as are the platforms and steps, and there is no wood whatever about the car except the timbers of the trucks.

The Passaic Rolling Mill Company, of Paterson, N. J., have decided to add two 20-ton open-hearth steel furnaces to their plant, at a cost of about \$100,000.

Among experts employed by a committee of the Legislature to examine the Assembly ceiling at Albany are several prominent architects from New York City.

Washington News.

(From Our Regular Correspondent.)

WASHINGTON, D. C., January 29, 1889.

It is now conceded on all sides that no action will be taken on tariff matters in the House which will lead to concurrence between the upper and lower branches of Congress. An effort was made when the Senate substitute reached the House a few days ago to waive the usual parliamentary routine of reference to the Committee on Ways and Means. The majority members of that committee, led by Chairman Mills and Representative McMillan, opposed the programme of asking a conference without a reference, while Representatives Reed and McKinley, of the minority, urged its adoption as a cross-cut to bringing the question down to a basis of negotiation with a possible prospect of a solution through a mutually acceptable proposition of compromise.

It was thought by the conservative members of both sides that there might be features in both measures, the House bill and the Senate substitute, which might afford an opening to a fusion bill which would be satisfactory to the conference, and in which the two Houses would concur.

Pending this debate, Representative McKinley submitted views on the subject which were interpreted to represent the position of General Harrison. He urged the compromise plan as a way to a settlement, and which would avoid an extra session, as there would be no chance of agreement if the bill was thrown into Committee on Ways and Means. It was also urged that this would put a stop to industrial agitation for some time. The Ways and Means majority, seeking to cover themselves from the chagrin of the Tobacco bill reference to the Committee on Appropriations, insisted upon the reference to their committee, promising a report forthwith. The bill and amendments were so referred, and the question now is as to the action of the committee.

The Cowles Tobacco bill, referred to Mr. Randall's Committee on Appropriations, may be regarded as abandoned. Chairman Randall is not disposed to antagonize his own party by widening the breach on the tariff issue, and he has discovered that it would be impossible to secure a majority of the committee on any measure.

The Committee on Appropriations are sadly broken up. The nine Democrats are not a unit on the Cowles bill, and the six Republicans are a unit on the Senate substitute, which they will put forward with a minority report if Mr. Randall undertakes to make a move on the Cowles measure. The death of Mr. Barnes, of the committee, would add to the complications. If the chairman should make an attempt to report back the bill he would find himself in a hopeless minority. A poll of the committee by friends of the Ways and Means shows that if the issue were made seven Democrats would oppose a favorable report of the Cowles bill, the six Republicans would favor the Senate substitute, which would leave Chairman Randall in favor of the Cowles Bill without any following. The chairman appreciates the situation and will not take any steps. Therefore, the spurt of the tobacco men comes to naught.

The question, therefore, reverts to the Committee on Ways and Means, with a promise that the bill and amendments will be reported back in time to receive action by this Congress. The carrying out of this purpose will in all probability close up the tariff agitation of the Fiftieth Congress with a lively display of parliamentary skirmishing. The Republicans are not willing to permit the Democrats to secure

any prestige from tariff action, and without them the tobacco men are powerless, as they represent but a mere squad as compared with the strength of their party on the other side.

A subject of greater importance than the defunct tariff issue in Congress is the selection of a Secretary of the Treasury for the new Cabinet. The preference of the President-elect and the choice of the Republicans generally is Senator Allison, of Iowa, but the Senator himself wisely feels great reluctance, and his friends are outspoken in their opposition to his acceptance. The Senator has never even entertained the thought of leaving the Senate with any degree of complacency, and he has only regarded it at all in the light of a personal sacrifice to relieve the new President of an embarrassment arising from two causes: (1) his desire to make the selection of his fiscal minister from the West, and (2) the factional hostilities in New York, which would preclude a selection from that direction should he desire to look that way.

The friends of Senator Allison assert with great force that he is the representative man of the Western idea of the tariff. He has done more to build up a protective tariff sentiment in the West than any other person of that section in public or private life. During the transition stage of public sentiment from war tariffs and taxation to revenues based upon the requirements of peace, he held his State in line in favor of the protective policy. The West has followed the course of Iowa until we find that great section as strongly allied to the American idea as the Middle States, and as much or more so than some sections of New England. William B. Allison was the chief instrumentality in bringing about this condition of public opinion in the West on economic questions.

Senator Allison, ever since his interview with General Harrison *en route* to Washington after the election, has felt that his place would be in the Senate. He despaired of concurrent action on the tariff, and therefore felt the importance of remaining in the Senate to co-operate in legislation which would be certain to come up in the next Congress. Although the diurnal grist of speculation from Indianapolis puts him down as having accepted the Secretaryship of the Treasury, his closest friends are still confident that he has not and will not accept the position, but that he will remain where he is, with a prospectively upward promotion in 1892, instead of downward promotion now. The declination by Senator Allison would leave McKinley, of Ohio, as the most available man for the West for the portfolio of the Treasury. It is expected before another week rolls around that something tangible will have transpired on the question of the Chief of the Department which regulates the revenues, recommends tariff legislation, and interprets tariff schedules.

The talk of the Pittsburgh Steel Casting Company about turning out another steel gun creates some discussion in ordnance circles. The army and naval experts, however, discourage the step until the Thurlow gun, which will be of open hearth steel shall have been tested. While the projectors of this style of ordnance have not lost faith in their projects, the officers and men who would be compelled to risk their lives in using such guns do not show any degree of enthusiasm in that direction.

Shipbuilding revived remarkably in Great Britain during the year 1888, reaching 903,687 tons, against 687,000 in the previous year, and, except in two previous years has never been greater than in the year just expired.

TRADE REPORT.

Chicago.

Office of *The Iron Age*, 95 and 97 Washington street, CHICAGO, January 28, 1889.

Pig Iron.—The tonnage of the market has not improved in the past week. The very low level which prices have struck has, however, induced a number of consumers to place contracts who would otherwise have hesitated longer. Efforts were made, without success, to buy special brands for long deliveries at present prices, the makers being willing to sell only for early shipment and taking their chance for a better price later in the year. This will not happen unless production has been sharply curtailed and consumers realize that the supply is not greater than the demand. In the meantime it will be remarkable if prices do not go lower. Consumption is decreasing rather than increasing, and stocks in foundrymen's yards are shrinking very slowly. Still it does not seem possible that much more of a decline can take place at this particular point than has already been experienced. But the fact must not be overlooked, in considering the situation, that if the coke strike threatened on the 1st of February in the Connellsville region actually takes place an immediate restriction of production, and much greater than if caused by the mere condition of the Pig Iron market, will be made. Should the strike last from two to three months the price of Pig Iron would advance considerably, to the benefit of Southern furnacemen and others not dependent on the Connellsville region for their fuel. Lake Superior charcoal shows no change in price, being apparently as firm as ever. Several contracts for round lots are pending. It is understood that some sales of high numbers recently alleged to have been made at other points were not consummated and the parties are now in the market. Cash quotations on ordinary lots are as follows, f.o.b. Chicago: Lake Superior Charcoal, Nos. 1, 2 and 3, \$20; American Scotch (Blackband), No. 1, \$19 @ 19.50; No. 2, \$17.50; Jackson County Silvery, No. 1, \$17.50 @ \$18; other Ohio Soft Irons, No. 1, \$17 @ \$18; Lake Superior Coke, No. 1, \$16.50 @ \$17; No. 2, \$15.50 @ \$16; No. 3, \$14.50 @ \$15; Southern Coke, No. 1 Foundry, \$16 @ \$16.50; No. 2 Foundry and No. 1 Soft, \$15.25 @ \$15.75; No. 3 Foundry, \$15; No. 2 Soft, \$14.25 @ \$14.75; Gray Forge, \$14 @ 14.50.

Bar Iron.—While a fair volume of business is reported for the week, prices have been barely sustained. Values are tending downward, but the decline seems to be stubbornly resisted by the manufacturers, who are acting very conservatively and yield only when they must. The prices which some of them are quoting indicate that they are either indifferent about new business or that they have strong faith in an early recovery from the prevailing depression. They name 1.75¢, half extras, f.o.b. Chicago, for mill lots, and will take no less. Others quote 1.70¢, and this appears to be the going price for ordinary specifications for good Common Iron, shaded, of course, for desirable orders. Small lots continue to sell at 1.90¢ @ 2¢ from store, according to quantity and quality.

Structural Iron.—Business is quiet and prices are easier. In the case of Beams, however, the situation seems to have changed and rumors are current of an advance to be made to 3¢. Mill lots are quoted as follows, f.o.b. Chicago: Angles and Sheared Plates, 2.12½¢ @ 2.15¢; Universal Plates, 2.20¢; Tees, 2.45¢

@ 2.55¢; Beams and Channels, 2.90¢; Small lots from stock sell at the following rates: Angles, 2.25¢; Tees, 2.70¢; Beams, 3.50¢ for domestic.

Plates, Tubes, &c.—A number of contracts for considerable quantities of Plates are pending, but the parties seem to be in no hurry to close. Current trade is very light. Small lots sell as follows from store: Sheet Iron, Nos. 10 to 14, 2.50¢; Sheet Steel, 3¢ @ 3.50¢; Tank Iron, 2.40¢; Tank Steel, 2.60¢ @ 2.75¢; Shell Iron, 3¢; Shell Steel, 3.12½¢; Flange Iron, 4¢; Flange Steel, 3.50¢; Fire-Box Steel, 4.75¢ @ 5.75¢; Boiler Rivets, 4¢ @ 4.25¢; Ulster Iron, 3.75¢. Boiler Tubes, 62½¢ off.

Sheet Iron.—Both Black and Galvanized are in very moderate demand at present. Prices are unchanged, small lots of Black being quoted at 3.10¢ for No. 24 to 3.80¢ for No. 27, and Galvanized at 65¢ off for Juniata and 65¢ and 2½¢ off for Charcoal.

Merchant Steel.—Prices of Tool Steel are slowly settling to their old basis of values before the formation of the association, with but little business offering. Quotations are as follows: Bessemer Bars, 2.30¢; Tool Steel, 8¢; Specials, 13¢ @ 25¢; Crucible Spring, 3.75¢; Open-Hearth Spring, 2.25¢ @ 2.50¢; Open-Hearth Machinery, 2.30¢ @ 2.40¢; Tire, 2.25¢ @ 2.50¢; Sheet, 7¢ @ 10¢.

Steel Rails.—The sales on account of the local mills during the week aggregated about 10,000 tons. Other contracts are pending. The situation is still unchanged, a light year's business being indicated. Prices are firm, however, at \$30 for large lots and \$30.50 for small quantities.

Old Rails and Wheels.—Old Iron Rails are very dull. Nothing has transpired during the week to establish prices, but dealers quote them nominally at \$21 @ \$21.50. Some inquiry is noted for Old Car-Wheels, and a small lot was sold for \$19.50. This, however, could not be obtained for any considerable quantity, buyers offering \$19.

Scrap.—Trade is very limited. Mixed Country is worth \$14. Carefully Selected is offered at the following rates by city dealers, per ton of 2000 lb: No. 1 Railroad Wrought, \$20 @ \$20.50; Track, \$19; No. 1 Mill, \$14 @ \$15; No. 2 Mill, \$10; Horseshoes, \$18.50; Axles, \$26.50; Machinery Cast, \$13.50 @ \$14; Stove Plate, \$10 @ \$11; Cast Borings, \$8.50 @ \$9; Wrought Turnings, \$10.50 @ \$11; Axle Turnings, \$12.50 @ \$13; Coil and Leaf Steel, \$15 @ \$16; Tires, \$16; Mixed Steel, \$10.50 @ \$11.

General Hardware.—An excellent demand is reported in every branch. The Shelf Hardware jobbers state that their trade is increasing steadily. The Heavy Hardware jobbers are doing a much better business than last year at this time. Those who handle specialties also report a very encouraging influx of orders from every section reached by them. Aside from this there are no special features to note.

Nails.—Manufacturers' agents for Steel Nails are expecting an advance of 5¢ or 10¢ in the factory price to be declared this week. Pointers have been freely given to customers, and the placing of orders has thus been stimulated to some degree, but not enough to make trade very active. The charge having been made that the Calumet Iron and Steel Company are cutting prices, they state that although they do not belong to the association they are as deeply interested as any of the members in keeping prices up, and that they are doing so, relying upon the quality of their product to give them their share of orders. Jobbers are doing a very good business, but their prices are still un-

settled. In view of the anticipated advance by the manufacturers, some of the jobbers are now taking a firm stand against anything less than \$1.95 for carloads and \$2 for small lots. Wire Nails show no improvement in price, although some manufacturers have declared themselves out of the market, having orders which will absorb their capacity for two months, and others are endeavoring to make \$2.40, Chicago, the bottom rate for large lots. With one or two concerns naming lower figures, and as low as any thus far made since the break, an actual advance is decidedly retarded. Jobbers quote \$2.50 as the regular price from stock, with \$2.45 for mixed carloads.

Barb Wire.—The demand is still improving, but prices are not better. In fact, large lots can now be bought from the manufacturers at lower rates than those named in December, but it is not likely that this condition of affairs will continue any length of time. A heroic remedy is being administered to cure a very stubborn disease. Jobbers quote Painted at 2.90¢ and Galvanized at 3.50¢, with 10¢ per 100 lb off for carloads.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St. PHILADELPHIA, Pa., January 29, 1889.

Pig Iron.—A considerable amount of business has been done during the past week, the larger proportion, however, being at what may be called "cut rates." Some brands still command firm quotations, but in the majority of cases the lots are small, or under a guarantee of protection in case of any general reduction in prices before deliveries are completed. This, of course, shows a great want of confidence, and is almost equivalent to a decline, although there is still a possibility that such a contingency may be avoided. Much will depend on developments the next two or three weeks. A great deal of Iron is being consumed, and so far as this section is concerned there is no serious overproduction, but the market cannot take the large offerings from other sources without displacing similar quantities of the home product. Price, therefore, becomes an important factor. Some fair-sized lots of Southern Irons have been taken within the past month or six weeks, probably 15,000 tons in all, besides a considerable amount of Western Foundry Iron in small lots. This in addition to the usual accumulations during the holiday season has caused steadily increasing stocks in this vicinity, and brings furnacemen face to face with the question whether they will meet the prices made for outside lots, or limit their output and maintain prices and lose a portion of their trade. Some leading concerns will undoubtedly accept the former alternative; others cannot do so without involving serious loss, and will probably "blow out" their furnaces. Meanwhile the feeling is very unsettled, with a probability of its continuance until some adjustment is made to meet the conditions which we have endeavored to define. For the near future, prospects are not at all encouraging, although it is claimed that some of the more urgent sellers having placed their product, prices are likely to be somewhat steadier. There may perhaps be a slight reaction from the pressure of the last week or two, but, at the moment, the chances are that it will be only temporary, until some of the accumulations are absorbed, and that is hardly likely until there is a much better demand or a considerably reduced production, either of which involves time. In regard to current prices, there is variety enough to satisfy the most exacting, the extremes for good to choice brands being \$15 to \$17 at tide for Gray Forge, and \$17 to \$19 for

No. 1 Foundry, with the majority of sales at from 50¢ to 75¢ per ton above the inside quotations. Several lots of 1000 tons each of Gray Forge, including both local and Southern brands, were taken at \$15 @ \$15.25 delivered in consumers' yards, and No. 1 Foundry at \$17.50 @ \$18, although Southern No. 1 could be had at \$17, rail or steamer, for February and March shipments. Smaller lots of local brands have been taken at \$15.50 @ \$16 for Gray Forge and \$18 @ \$18.50 for No. 1 Foundry, but, as already stated, buyers will not take large lots unless guaranteed against a decline.

Foreign Iron.—Prices are too high to permit of business being done in this market. Asking rates are as follows: Bessemer, \$20, c.i.f., duty paid; Speigeleisen, \$27.25.

Blooms.—There is a good demand at prices quoted for some time past—viz.: Steel Nail Slabs, \$28.50 @ \$29, at mill; Billets, from \$32 to \$36, according to analysis; Run-out Anthracite, \$42 @ \$44; Scrap Blooms, \$32.50 @ \$34 per "bloom" ton of 2464 lb.

Muck Bars.—Market unsettled. There is more disposition to buy, but bids are not over \$26.50 @ \$27 at mill for good Bars, while sellers ask about 50¢ more.

Bar Iron.—The market has been somewhat more active, but without any indication of improvement in prices. The chances in this respect seem to be a shade more favorable, however, and as the mills get more orders on their books a little stiffening in values will naturally follow. It is not known that any large orders for Bars have been placed, although some of the mills claim to have had the offer of lots aggregating over 2000 tons, which they declined, more on account of dates for delivery than because of prices. A few large Skelp orders have been distributed around (about 2000 tons among local mills), so that things are more active, if not more remunerative. Prices, as already stated, are no better, and range from 1.75¢ to 1.85¢ for good to best quality of Bars, and 1.8¢ for Grooved Skelp, although large buyers expect to shade even these low prices, and have done so in cases in which new business was urgently needed.

Plate and Tank Iron.—Business in Plates is very disappointing. Some of the largest orders given out within the past month or six weeks were taken by Western mills, so that local concerns have been able to secure only small orders, and are therefore always on the lookout for new business. The result is low prices, with no immediate prospect of improvement. Prices are nominally unchanged, but on large lots concessions are not unusual. Quotations about as follows: 1.95¢ @ 2.1¢ for Ordinary Plates and Tank Plates, 2.1¢ @ 2.2¢ for Universal Plates; Shell, 2.4¢ @ 2.5¢; Flange, 3.5¢; Fire-Box, 4¢; Steel Plates, Tank and Ship Plate, 2.2¢ @ 2.3¢; Shell, 2.7¢; Flange, 3¢ @ 3½¢; Fire-Box, 3½¢ @ 4½¢.

Structural Iron.—The market is very quiet, with nothing but small orders coming on the market at present. Some of the mills are busy on old contracts, but there are more that are running close to the end of their order books, hence prices are irregular and somewhat weak, although quoted as before—viz.: Bridge Plate, 2¢ @ 2.1¢; Angles, 2¢ @ 2.1¢; Tees, 2.4¢ @ 2.6¢; Beams and Channels, 2.8¢ for Iron or Steel.

Sheet Iron.—A fair amount of business has been done, some pretty large lots having been taken on private terms. The market is steady at the following quotations:

Best Refined, Nos. 26, 27 and 28....3 @ 3½¢
Best Refined, Nos. 18 to 25....2¼ @ 3 ¢
Common, ¼¢ less than the above.
Best Bloom Sheets, Nos. 26 to 28....4¼ @ 4½¢
Best Bloom Sheets, Nos. 22 to 25....3¾ @ 4 ¢

Best Bloom Sheets, Nos. 16 to 21....3¼ @ 3½¢
Blue Annealed.....2.8 @ 2.8¢
Best Bloom, Galvanized, discount.....62½¢
Common discount.....67½¢

Merchant Steel.—There is a good demand at about the following quotations: Tool Steel, 8½¢ @ 10¢; Machinery, 2½¢ @ 2½¢; Crucible Spring, 3½¢; Crucible Machinery, 5¢; Best Sheet Steel, 10¢ @ 12¢; Second Quality 8½¢; Third Quality, 6½¢.

Steel Rails.—Business is very quiet and orders for fair-sized lots appear to have been taken at something less than quoted rates. In Eastern Pennsylvania \$28 at mill is claimed to be an inside rate, but orders from some of the Southern roads have been worked from Pittsburgh at what appears to be about \$27 at mill, unless special rates have been made with the transportation companies. The feeling is unsettled, with \$27.50 @ \$28 quoted for large orders.

Old Rails.—There is no change from last week, the market being quiet, but at firm quotations. Shipments would command about \$23.50 for T's or \$24 for spot lots, but sales have been chiefly for interior delivery, at about \$24.50 laid down at mills. Stocks are light, and holders very firm. Spot lots, \$24.25 bid to-day.

Scrap Iron.—The market is a little quiet, but there is no quotable change in prices, which remain as follows: \$20.50 @ \$21 for cargo lots; \$21.50 @ \$22 for carload lots, delivered, or for choice \$22.50; No. 2 do., \$14 @ \$15; Turnings, \$18 @ \$14; Old Steel Rails, \$20 @ \$21; Cast Scrap, \$15 @ \$16; do. Borings, \$9 @ \$10; Old Fish Plates, \$25 @ \$26; Old Car-Wheels, \$17 @ \$18, Philadelphia, or its equivalent.

Wrought-Iron Pipe.—There is a good deal of business doing, but prices are still irregular and unsatisfactory. Discounts are nominally unchanged, but on desirable orders concessions are frequently made. Quoted discounts nominally Black Butt-Welded, 52½¢; Galvanized do., 42½¢; Black Lap-Welded, 62½¢; Galvanized do., 52½¢; Boiler Tubes, 60¢.

Nails.—The demand is very light, as is usual at this season. Prices are unchanged, but very irregular, varying from \$1.75 to \$1.90 at mill for carload lots. Store prices remain at \$1.90 @ \$2. The agreement to restrict production is likely to be consummated shortly; meanwhile there are more Nails being made than can be sold at quoted rates.

J. W. Hoffman & Co., Philadelphia, who have for the past 17 years been located at 208 South Fourth street, will remove their offices to 333 Walnut street, and will have larger facilities for handling their increasing trade in Iron and Steel of all descriptions. J. Ogden Hoffman has been appointed Philadelphia agent for Carnegie, Phipps & Co., Limited, and Carnegie Bros. & Co., Limited, Pittsburgh, Pa. H. will also be located at 333 Walnut street.

Birmingham.

BIRMINGHAM, ALA., January 28, 1889.

Pig Iron.—There is absolutely nothing new in the Iron situation as regard prices, and trade is quiet. Stock on hand is light at all the furnaces, there having been quite a diminution since the first of the month filling orders ahead. There are two causes which operators believe may tend to make an improvement in the situation—viz., the Hull storage scheme and the sliding freight scale.

There is a much better feeling over the financial situation since the last report. Birmingham's greatest burdens—obligations on real estate speculation—are being very appreciably lightened, notably with-

in the last few days. As reported in *The Iron Age*, the depression in the business generally is attributed to the dullness in railroad building and the demand for such supplies.

Louisville.

LOUISVILLE, KY., January 28, 1889.

Pig Iron.—There have been a number of sales effected during the last week for delivery through the year. Prices continue low, with little prospect of an advance. Some of the leading furnaces are accepting orders for the year's delivery, believing that they cannot hope for an important change, and that, until the weaker furnaces are forced to go out, the market will continue depressed. The buying during the week has been largely among stove foundries and machine companies, and for future delivery, though their purchases for a year's supply are not as large as usual, as from the present depression there is a decided falling off in orders. We quote as follows:

Southern Coke, No. 1 Foundry, new classification.....\$14.75 @ \$15.25
Southern Coke, No. 2 Foundry, new classification.....14.25 @ 14.75
Southern Coke, No. 3 Foundry, new classification.....13.75 @ 14.25
Gray Forge.....13.25 @ 13.75
White and Mottled, different grades.....12.75 @ 13.25
Silver Gray, different grades.....13.00 @ 15.75
Southern Charcoal, No. 1 Foundry.....16.25 @ 16.75
" " No. 1 Mill.....14.75 @ 15.25
Southern Car-Wheel, standard brands.....21.75 @ 22.75
Southern Car-Wheel, other brands.....15.00 @ 19.50
Hanging Rock Coke, No. 1 Foundry.....15.50 @ 16.00
Hanging Rock Charcoal, No. 1 Foundry.....19.50 @ 21.00
Hanging Rock, Cold Blast.....20.75 @ 23.75

Cincinnati.

Office of *The Iron Age*, Fourth and Main Sts., CINCINNATI, January 28, 1889.

Pig Iron.—Very low prices have been made for Pig Iron in the local market during the past week, even lower than those reported in our last review. But sales have increased materially, some very large contracts having been closed during the past few days. These purchases have been made not alone by actual consumers, but some large amounts have been taken for speculative account. An analysis of the present market is no easy task. The tone is unsettled, and interested parties modify their views with each new report, giving prices an unstable character. Of course all agree that a reaction is bound to come sooner or later, but there is no unity of opinion that the bottom has been touched. Those buying upon speculative ideas admit the possibility, and even the probability, of lower prices, but the fact that the market is at a lower point than for many years gives them courage to buy for "long" account. Large consumers, especially Pipe works, which have large orders ahead, have shown confidence, to some extent, in making contracts for large amounts, but they have secured the benefit of time, the length of which gives some assurance of a profit upon purchases, as well as upon their manufactured article. A few sellers announce their belief that the market is at bottom, and that they prefer to wait awhile before parting with holdings; but it is noteworthy that these gentlemen have just sold liberal amounts of Iron. The majority of producers, if their sentiments are reflected with accuracy, will not be surprised to see a further material decline. One of the largest producers in the South, and one credited with unusual foresight, is reported to have said that the present demoralization will continue and prices will decline until furnaces which ought not to make Iron—those which have little or no capital of their own, but are operated on borrowed capital—are compelled to blow out. This means a war of extermination, or a natu-

ral weeding out process, a "survival of the fittest," according as it is viewed. The sales made here or consummated through Cincinnati agents during the past week aggregate about 50,000 tons, for delivery ranging from two to six months, some contracts being reported made extending throughout the year, but a majority of the transactions cover about four months; of this amount speculators are said to embrace nearly 20,000 tons, the remainder being made up of lots ranging from 1000 and 2000 to 7000 tons. No. 1 Southern Coke Foundry Iron is reported at \$14.50 @ \$15; No. 2 do. at \$14 @ \$14.50; No. 3 do. at \$13 @ \$13.50, but the inside prices are not openly named. Forge Iron at \$12.50 @ \$13 and Mottled at \$12. Many mixed lots, too, have been sold at varying rates. Dealers as a rule adhere to old "list" prices in their published reports. Northern Iron has sympathized more with the Southern product, and even Wheel Iron has ruled easier under less liberal orders. The following are the approximate prices current here at the close for cash, f.o.b.:

Foundry.	
Southern Coke, No. 1 (new classification).....	\$14.75 @ \$15.00
Southern Coke, No. 2 (new classification).....	14.25 @ 14.50
Southern Coke, No. 3 (new classification).....	13.50 @ 14.00
Ohio Soft Stone Coal, No. 1.....	15.00 @ 16.00
Ohio Soft Stone Coal, No. 2.....	14.50 @ 15.00
Mahoning and Shenango Valley.....	16.50 @ 17.00
Hanging Rock Charcoal, No. 1.....	21.00 @ 22.00
Hanging Rock Charcoal, No. 2.....	19.00 @ 22.00
Tennessee and Alabama Charcoal, No. 1.....	18.00 @ 18.50
Tennessee and Alabama Charcoal, No. 2.....	17.00 @ 18.00
Forge.	
Strong Neutral Coke.....	13.00 @ 13.50
Mottled Neutral Coke.....	12.00 @ 12.25
Gray Forge.....	12.50 @ 13.00
Car-Wheel and Malleable Irons.	
Southern Car-Wheel.....	20.00 @ 25.00
Hanging Rock, Cold Blast.....	22.00 @ 25.00
Lake Superior Car-Wheel and Malleable.....	21.00 @ 22.00

Manufactured Iron.—Has been moderately active and steady, without new features of prominence.

Nails.—The market has been without animation, and easy in tone: 12 @ 40d sell at \$1.90 @ \$1.95 $\frac{3}{4}$ keg, with 10¢ rebate in carload lots at the mills. Steel Nails sell at \$1.90 @ \$1.95, and Steel Wire Nails at \$2.60 @ \$2.65 $\frac{3}{4}$ keg.

Old Material.—There has been little trading, and prices have been nominal. Old Rails are difficult to sell at \$21.50 @ \$22, and Old Wheels are quotable at \$18 @ \$18.50, cash, here.

Kroger, Redway & Co. announce that, having succeeded to the business of R. J. Kroger & Co., they will continue to occupy the old office, Room No. 1, Allen Building, Fifth and Main streets. They are agents for the Schoonmakers Connellsville Coke, best grades of West Virginia and Ohio (Soft) Coke, and (Barton Mine) Piedmont Smithing Coal, favorably known as Cumberland Blossburg. They also deal in Iron Ore, Mill Cinder, Scrap Iron and Rails.

Chattanooga.

Office of *The Iron Age*, Carter and 9th Sts., CHATTANOOGA, January 28, 1889.

Pig Iron.—A correct report of the condition of the market at the present time would result in an "unknown quantity," and all the algebraic rules ever invented would not give a correct solution of the problem. Rumors of sales of large round lots at distressingly low figures are flying around in every direction, but careful inquiry of the alleged sellers results in the fact that no such sales have been made. The Tennessee Coal and Iron Co. were reported to have offered Nos. 1 and 2 Foundry at very low prices, but got no takers, when the truth of the matter is that

they have not a pound of No. 2 to offer for delivery under 60 days and No. 1 under 90 days at any price. A party from the North visited the Southern districts prepared to buy 25,000 to 50,000 tons for spot cash, and expected to get No. 1 for about \$12 @ \$12.50, and Gray Forge for about \$10 @ \$10.50, but has left the field without buying a pound. The fact is there is no such priced Iron for sale in the Southern districts. Many of the furnaces are all sold up and those that are not are realizing profitable figures on what sales they are making, or are stacking their output. It cannot be denied but what prices have receded, but the statements made by many that prices have gone to the figures reported cannot be substantiated by facts. \$13 @ \$14 is the basis at which No. 1 can be bought for now, about 50¢ @ 75¢ less for No. 2 Foundry, and there are some who will not sell at these figures. The failures at Nashville and Sheffield have been discounted for a long time by those who were on the inside and have created no surprise.

Miscellaneous.—The past week or two has developed quite an active stir in business, and the future is looked upon as a period that will develop an active season in all mercantile lines.

Cleveland.

CLEVELAND, January 28, 1889.

Iron Ore.—The local representatives of the big mining companies in the Lake Superior district steadfastly maintain that no steps affecting the prices for Ore for 1889 have yet been taken. While asserting that the opening prices for Ore will, in all probability, be about 25¢ or 50¢ above those of 1888, it is confidently claimed that active inquiries from the furnacemen are not expected for at least three weeks to come. This feeling on the part of the Ore dealers is due in no small measure to the fact that many Eastern furnaces, especially those along the line of the Lehigh Valley road, are determined to buy their supplies of Ore on this side of the Atlantic. Their determination to substitute domestic for foreign Ore means, it is claimed, a total output in the Lake Superior region of at least 6,000,000 tons of Ore in 1889. The Ore receipts at Buffalo in 1887 were but 30,700 tons. Last year they were 247,000 tons. With the increased dock facilities, prepared by the Lehigh Valley Company, and with the furnaces at Syracuse, Troy, Ironton and elsewhere demanding native Ores, the Buffalo trade this year is not unlikely to reach 600,000 tons. This phase of the situation in a measure accounts for the apparently disinterested position of the mine owners who now claim that they can well afford to await the demands of the furnacemen. The little stacks of unsold Ore on the docks are being rapidly disposed of, less than 35,000 tons now remaining in the possession of the dealers. Fully 30,000 tons of Ore were shipped to the furnaces last week.

Pig Iron.—The tone of the market is slightly improved, Ohio Coke Irons, at a reduction of 50¢ $\frac{3}{4}$ ton, being in fair demand, and Car-Wheel Irons, at about the same sacrifice, finding quite a number of purchasers. As long, however, as the furnacemen are not compelled to enter the market the demand is bound to continue light, and substantial orders will be few and far scattered. The sacrifice in prices is far from universal, many furnacemen declining altogether to make concessions for the sake of orders. Buyers, in looking after current needs, are less solicitous than might be expected about obtaining low prices, and few sales of small lots have occurred below 50¢ reduction from the long-prevailing quotations for standard

Irons. Many foundries are looking forward to good orders for Iron in the architectural line.

Scrap Iron.—Old American Rails are selling in small lots at \$24.25. The market as a whole is dull, and sales of all kinds are scattering.

Nails.—Steel Wire Nails at \$2.40 are about the only articles in the market enjoying any degree of demand. Business with both jobbers and store men is limited.

Manufactured Iron.—A majority of the dealers are firm in the belief that Bars, Plates and Sheets will be selling freely before March 1. The market at present is lifeless, and Common Bar does not command prices in advance of 1.60¢.

[Later by Telegraph.]

Interviews with the principal consumers in the Mahoning and Shenango valleys reveal their willingness to pay last season's opening prices for new Ore. A dozen different mining companies are following the established custom of waiting for the Republic mine to fix prices before announcing their schedule of rates. Not a pound of new Ore has been sold. A representative of the Carnegie interests said this morning that letters had been received from several mining companies relative to new Ore, and that replies were sent indicating the Carnegie company's readiness to buy at the mine-owners' prices. It is rumored to-day that the Republic will announce \$6.25 as its opening price. The depression in the Rail and Bessemer-Pig markets will, it is said, operate against high prices for Bessemer Ore at the beginning of the season. Representatives of the large Pig-Iron interests in Ohio and Pennsylvania go to New York to-night to protest against the increased freight on Pig Iron ordered for February 1.

Detroit.

WILLIAM F. JARVIS & Co., under date of January 28, 1889, report as follows: There has been an absence of any large dealings in this market during the past week. On account of the low offers recently made here by some Southern furnaces and the very low prices at which these Irons have been sold in other sections, buyers are inclined to wait until values are more settled and they can feel sure prices have reached the lowest point. Most Coke Irons are lower in sympathy. While Lake Superior Charcoal is being held at prices asked a month ago, it is a question whether they will not also be affected. Makers of this grade claim that consumption will be fully up to the production, and, therefore, no cause exists for lowering quotations. We quote for the present as follows:

Lake Superior Charcoal, all numbers.....	\$20.00 @ \$20.50
Lake Superior Coke, all ore.....	19.50 @ 20.00
Lake Superior Coke, cinder mixed.....	18.00 @ 18.50
Southern No. 1.....	17.25 @ 17.75
Southern Gray Forge.....	15.25 @ 15.75
Southern Silvery.....	17.00 @ 17.50
Jackson County (Ohio) Silvery.....	18.50 @ 19.00
Old Wheels.....	20.00 @ 20.50

Pittsburgh.

Office of *The Iron Age*, 77 Fourth Ave., PITTSBURGH, January 20, 1889.

There has been no important change in the general Iron and Steel industries during the week under review; trade is still reported dull and unsatisfactory. It is believed that tariff agitation has contributed as much as anything to the dullness that has prevailed of late. Another matter that tends to depress business in the two great industries of Pittsburgh, Iron and Steel, is the fact that a large number of natural gas contracts expire shortly, and if the advanced prices for gas are insisted

upon it is probable that a number of manufacturers will drop the gas and go back to coal.

Pig Iron.—The market continues in a depressed and unsatisfactory condition, but it is hoped that there will soon be a change for the better. Consumers have little or no stock, and just as soon as they begin to think that prices have touched the lowest point they will want to contract for future delivery. Furnacemen argue that the point in question has been reached already, and one of the strong points advanced, in view of their position, is that present prices scarcely cover actual cost, with but little prospect of much, if any, reduction in the production. We quote prices as follows:

Neutral Gray Forge.....	\$14.75 @ \$15.25,	cash.
All Ore Mill.....	14.00 @ 14.50,	"
White and Mottled.....	15.50 @ 16.00,	"
No. 1 Foundry.....	16.75 @ 17.00,	"
No. 2 Foundry.....	15.75 @ 16.25,	"
Charcoal Foundry.....	21.00 @ 24.00,	"
Cold Blast Charcoal.....	25.00 @ 28.00,	"
Bessemer Iron.....	16.50 @ 16.75	"

Best brands of city-made Forge Irons are to be had for immediate delivery at \$15, cash; it is doubtful whether furnacemen would contract for future delivery at the price quoted. Foundry Irons continue very dull; Bessemer continues weak; sale 600 tons at \$16.75, cash, and 1000 tons for delivery next month at \$16.50, cash; in the latter there has been a decline of 25¢ to 50¢ per ton within the past few weeks.

Muck Bar.—Continues very dull, and prices have further declined; we now quote, in the absence of sales, at \$27 @ \$27.50, cash. We are reliably informed of an offer to sell at \$27. The quotations above noted show a decline of \$1 per ton within a few weeks, and no demand at the decline.

Manganese.—Sale of 80 % Ferromanganese at \$55.50 @ \$56, cash; and Spiegel at \$28 @ \$28.50, cash, for 20 %. Demand is chiefly for small lots.

Manufactured Iron.—Orders continue to come forward sparingly, but it is hoped and expected that there will be an improvement in the demand before long, and there is every reason to believe that there will be. Prices continue weak and irregular, in sympathy with the raw article. Bars, 1.75¢ @ 1.80¢; Plates, 2.10¢ @ 2.20¢; No. 24 Sheet, 2.80¢ @ 2.90¢, all 60 days, 2 % off for cash. Skelp Iron, 1.75¢ @ 1.80¢ for Grooved, and 1.90¢ @ 2¢ for Sheared.

Nails.—There is nothing doing in the Nail trade here; no change in prices. Pittsburgh manufacturers continue to quote at \$1.90 for 12d @ 40d, 60 days; 2 % off for cash, but Wheeling continues to sell at a \$1.80 base, and, while there is difference, Pittsburgh has but little show for business. The Wheeling manufacturers will hold a meeting to-morrow, one of the main objects of which, it is said, is to advance prices. Pittsburgh makers say there is but little margin at the \$1.90 card, and, if so, it is not strange that Wheeling wants to advance prices.

Wrought Iron Pipe.—There is a fair business for the season, and but for the manner in which prices are being cut there would be but little room for complaint. A few large concerns are doing the bulk of the business; some manufacturers are not anxious for business at present prices, and but for a desire to hold their trade they would shut down. We quote discounts on Black Butt-Welded Pipe at 55½ @ 57 %; on Galvanized do., 50 and 5 %; on Black Lap-Welded, 65 % @ 67½ %; on Galvanized do., 55 and 2½ %; 2-inch Tubing, 11½¢ per foot, net; 5½-inch Casing, 35¢ per foot, net; Boiler Tubes, 65 % off.

Old Rails.—The dullness noted for some time continues, and in the absence of sales it is difficult to give reliable quotations. We hear of offers to sell Amer-

ican Tees at \$24, and it is fair to infer that if offered at the price quoted they could be bought for less. The work of "lifting" has not this winter had to be suspended in consequence of the weather, and the supply has been kept up much better than expected thereby. But for the open winter the course of the market would have been very different from what it has been. Old Steel Rails quoted in absence of sales at \$18 @ \$18.50 for short and \$19.50 @ \$20 for long lengths.

Steel Rails.—Are still quoted at \$28 cash orders at mill here, but for a desirable order there is little doubt but what the price quoted would be discounted, as the mills are all anxious for business. While there are those who believe that there will be as many Rails wanted this year as last, others are of a different opinion.

Billets, &c.—There is but little inquiry for Bessemer Steel Billets and prices are weak; quoted at \$28, cash, at maker's mills; Nail Slabs \$27.50 @ \$28; Domestic Blooms and Rail Ends, \$18.50 @ \$19, with but little inquiry.

Railway Track Supplies.—There is not much inquiry just now, but an improvement in demand is looked for next month. Prices remain unchanged. Spikes, 2.05¢ @ 2.10¢, 30 days, free on cars here; Splice Bars, 1.80¢ @ 1.85¢; Track Bolts, 2.80¢ with square and 2.90¢ with hexagon nuts.

Merchant Steel.—No change in prices. Best brands Tool Steel 8½¢; Crucible Machinery, 5¢; Open Hearth do, 2½¢.

Old Material.—Is less active and weaker; sales No. 1 Wrought Scrap at \$20.75, net ton; Old Car Axles, \$24.75; Cast Scrap, \$14.75 gross; Old Car-Wheels nominally \$19 @ \$19.50 gross.

New York.

Office of *The Iron Age*, 66 and 68 Duane street, New York, January 30, 1889.

From every department of the Iron and Steel trades come complaints of a most unsatisfactory state of affairs. Prices, almost without exception, are down to cost for the most favorably situated concerns, and in some instances are decidedly below it. Importations have practically ceased, except in some specialties. Already the number of sellers in many lines is narrowing down to a small number. Among them there is a sharp rivalry, in which ordinary business prudence is often thrown to the winds, and personal antagonism, retaliation and spite are allowed full sway. Such a condition of affairs certainly cannot last long. When more prudent councils prevail, when those so eager for tonnage have been filled, a reaction is sure to set in which will cause a very rapid advance to more reasonable figures. We see no immediate prospect for this change, but all interested in the trade should keenly watch for the slightest indication, since the recovery to at least living rates is likely to come with a rush. It is in the nature of the business that the adjustment to present circumstances is least likely to be very prompt in the case of the Pig Iron manufacturers. A rolling mill or foundry can generally be closed down at short notice and without serious direct loss. It is different with a furnace. Blowing out involves future heavy outlays, without considering that generally furnaces must have long-time contracts for raw materials. One point deserves special mention, and that is the heavy consumption of last year. In spite of the fact that the production slightly exceeded that of 1887, the stocks at the end of the year were only 336,161 net tons on December 31, 1888, as compared with 401,266 net tons on June 30,

and 338,142 net tons on December 31, 1887. Leaving out of account imports, the statistics indicate that our consumption during the second half of 1888 was 3,528,777 gross tons, or, considering accumulations of Bessemer Iron as an offset to lessened imports, at the rate of 7,000,000 gross tons per annum. This was in spite of the heavy falling off in the production of Steel Rails.

Foundry Pig.—The market is stagnant, waiting for developments. Low offerings do not appear to tempt buyers, and it is difficult to form any definite conclusions what prices could be realized if an attempt were made to force sales, even of standard brands. Southern Iron has been offered at \$16.50 for No. 1 without having found any takers. As yet no announcement of opening prices has been made by the leading Lehigh company, events being watched closely before any course of action is decided upon. A determination to hold trade is, however, freely expressed. An event, so far as the northern part of this State and certain sections of New England are concerned, is the blowing in of one of the Troy furnaces on Foundry Iron. With a capacity of close upon 1000 tons a week, a cheap Ore mixture, Coke as fuel, and thoroughly modern plant, the furnace will be able to produce good Iron cheaply and make a serious struggle against the Mahoning Valley and Shenango Valley Irons which have secured so strong a hold in that section. We understand that experiments with different mixtures are now being made before the product will come into the market. In reference to the delays in the delivery of Southern Iron, alluded to recently, we are informed that they apply only to the Savannah line, that shipments are prompt via Norfolk, and that the rates are the same—viz., \$3.75 from Chattanooga and \$3.86 from Birmingham to Philadelphia and New York, and \$4 from Chattanooga and \$4.11 from Birmingham to Boston. Southern furnaces have also low freights to a number of interior points in Central and Eastern Pennsylvania. We quote nominally for Standard brands \$17.75 @ \$18 for No. 1, and \$16.50 @ \$17 for No. 2 Foundry.

Scotch Pig.—The market continues very dull. The Anchor and State lines have each taken off two steamers, so that now there are only two instead of four monthly from Glasgow; the freights, however, remaining 4/. Coltness, \$20.50 @ \$21; Shotts, \$20 @ \$20.50; Langloan, \$20 @ \$20.25; Summerlee, \$20.25 @ \$20.50 and Dalmellington, \$19.25 @ \$19.50.

Plates.—We quote Iron Tank, 2¢ @ 2.2¢; Shell, 2.25¢ @ 2.4¢; Steel Tank and Ship Plate, 2.15¢ @ 2.25¢; Shell, 2.35¢ @ 2.5¢; Flange, 2.6¢ @ 2.75¢, and Fire-box, 3½¢ @ 4¢.

Structural Iron.—The market is quiet, dull and weak. We quote Sheared Plates, 1.9¢ @ 2¢; Universal Mill Plates, 2¢ @ 2.1¢; Angles, 2¢ @ 2.10¢; Tees, 2.4¢ @ 2.6¢, and Channels and Beams, 2.8¢ on dock for all sizes.

Bar Iron.—We quote: Carload lots on dock, half extras, Common, 1.65¢ @ 1.75¢; Medium, 1.75¢ @ 1.8¢, and Refined, 1.8¢ @ 2¢.

Steel Rails.—During the past week facts have come to the surface which have again considerably unsettled the Steel Rail Market. There has been a sharp struggle over Southern business, the majority of the contracts having been secured by a Pittsburgh mill. The lack of business in the West and Southwest, the inability to obtain work in the Northwest, have apparently, coupled with a desire for a large tonnage, led to an eagerness

to secure Southern orders in territory in which mills further East are supposed to have a commanding position. It is reported that sales have been made on the basis of about \$26 at Pittsburgh mills, rumor having even brought out lower figures, which, however, are not to be credited. The result has been a weakening on the part of some of the Eastern mills, and \$27 is now freely named where \$28 was formerly nominally quoted. One Eastern mill has sold 12,500 tons, Norfolk delivery, at \$28.25, and it is rumored that a Pittsburgh mill has taken 20,000 tons for a new enterprise in North Carolina. An unusual transaction also reported is the sale by an Eastern mill of 2500 tons for Chicago delivery, the price given being \$30.60, equivalent to \$27 at the mill. We note in addition a sale of 1500 tons by an Eastern mill, at private terms. The order for a Virginia road, alluded to in our last report, turns out to have been for 5000 tons with an option of 5000 tons more. It was taken by a Pittsburgh mill. We quote nominally \$27 @ \$27.50 at Eastern mill, with the market in buyers' favor.

Merchant Steel.—The market continues demoralized. Spring Steel has sold at \$43 gross ton flat, delivered, 3% off, ten days; Tire, delivered, without extras, 2.05¢, $\frac{1}{8}$ x $\frac{1}{4}$ square edge at 2.25¢, delivered.

Track Material.—The market is very weak. The sale is reported to a road in this vicinity of 8000 kegs of Spikes, delivered at Albany and Buffalo, at a figure which is below cost and which other makers decline to meet, quoting \$2 @ \$2.05. The same road has purchased 50,000 sets of Steel Angles at private terms. Angles are freely quoted 1.80¢ @ 1.85¢, delivered.

Axles.—A circular has been issued by a leading Pittsburgh mill, quoting Axles, master car builders' standard, Iron or Steel, at 2¢, at mill.

Wire Rods.—Only a very small business has been transacted, although stocks of Eastern Wire mills are running low. The situation in Germany is peculiar. The large works, which make their own Steel, are indifferent sellers, because they claim to be able to make more money by turning their material into other channels. They either let their Rod mills remain idle or make Bars or light Rails on them. The small works would be glad to sell at present prices if they could get Billets at anything like reasonable prices. The result is that 108 marks @ 110 marks is being asked at shipping port, with freights to this country at 11/ @ 12/. This it is claimed makes it impossible to sell here at less than \$42, while \$41.50 is the highest bid. Direct cable offers have been made of Basic Rods at \$39.50, but they excite suspicion and would only be taken to meet contingencies. Eastern domestic mills are doing something in the larger numbers, No. 0, No. 1, &c., for which there is quite a demand in the aggregate. The higher rate of duty on them forces importers to demand \$44.50, so that the home mills have a good chance to take the business.

Old Rails.—On the seaboard Old Rails continue scarce, with some demand, but no sales. We quote \$23 @ \$23.50 for Tees, with the majority of holders very firm.

Frank D. Moffatt & Co., 100 Beekman street, this city, have been appointed exclusive sales agents for the State of New York and the Northern part of the State of New Jersey for the Pig Iron made by the Brier Hill Iron and Coal Company. The well-known Softener, Brier Hill Scotch, is made by this company.

Coal Market.

The Coal trade is extremely dull in all departments, and stocks at tidewater are accumulating despite efforts to restrict work at the mines. In the Wyoming region the mines are worked on short time only three days in the week, and in the Lehigh region several collieries have suspended altogether. Although Reading has a number of idle collieries the company report a stock of fully 130,000 tons of Port Richmond. For the week ended January 26 the production was 543,392 tons, which is a decrease of 100,000 tons compared with the week ended January 12, but 114,000 tons in excess of the corresponding week in 1888. Since January 1 the production is 83,000 tons larger than for the same time last year. Prices are cut by outside operators to the extent of 25¢ @ 40¢ per ton, and sales are reported at even lower figures. The Lehigh and Schuylkill Coal Exchanges decided to maintain present prices during February. D. B. Duncan and Nelson J. Gates were appointed receivers of the Coal firm of M. J. Gaffney & Co., of Brooklyn.

Bituminous Coal is depressed from the effects of excessive production, and occasional sales are reported at the lowest figures, say about \$2.90 alongside. Beech Creek is still outside of the Seaboard Association.

Cumberland production for 1888 amounted to 3,671,067 tons, an increase of 295,000 tons compared with 1887.

The Commissioners of Charities and Correction have given David B. Duncan the contract for furnishing the department with 28,000 tons of Coal during the coming year. His figure was \$3.92½ per ton, or 6½¢ per ton cheaper than he filled the same contract for last year.

Metal Market.

Copper.—At the time of our last week's report Spot Chili Bars and Good Merchantable still stood £77½; futures, £78 and Best Selected, £79. 10/. Since then a sudden demoralization and weakness have overtaken the London market, and yesterday spot only brought £73 and futures £75. To-day quite a sudden recovery is cabled, spot being worth £77. 10/ for Chili Bars and Good Merchantable, but futures remain £78. While this change occurred, Best Selected declined from £7.10/ to £77. The first intimation that there was something wrong reached us by cable from Paris, under date of 25th inst., when Rio Tinto shares dropped 67 francs, there being a rumor on the Stock Exchange there that contracts bearing on the formation of the English Copper Company in connection with the French syndicate had fallen through. It is pretty certain that the French syndicate has latterly abstained from buying either futures or spot Copper, but whether its collapse is near at hand or distant is altogether problematical. Of course if Copper were sold on its proper merits, the enormous accumulation of stock on hand would probably not bring more than about £30 @ £40, but experience has taught us that it is dangerous for any speculators to assume that the downfall of the big companies is approaching and sell futures on such assumption. This situation causes hesitation not only to a certain extent in London, but also on this side. What has caused the sudden recovery to-day may possibly be that the syndicate has come to the rescue after perfecting its financial arrangements. Yesterday 25,000 lb of March were sold as low as 16¢, while to-day the same amount sold for 16.40¢. The only bid that can be got for the coming month is 16.25¢, and under these circumstances the spot quotation is practically nominal. For the first 11 months of

last year there was shipped from Spain 756,941 tons of Pyrites, against 701,841 tons in 1887 and 61,884 tons in 1886; of Precipitate it was 26,458 tons, against 25,500 and 24,794 respectively. James Lewis & Son, of Liverpool, in their annual report, say: "The increased production cannot be considered excessive, considering the high price of Copper, but what has surprised the trade is the great falling off in the deliveries of Copper, pointing to a diminished consumption of 87,478 tons in England and France. These reduced deliveries are, however, misleading, and do not represent the actual consumption, as a considerable quantity of old Copper lying in England and France has been worked up during the year—probably 5000 tons; and it must also be borne in mind that smelters and consumers bought largely during the rise toward the close of 1887, and so commenced the year 1888 with considerable stocks, while at present they are holding as little as they possibly can. This difference we estimate at about 15,000 tons. The actual consumption has, therefore, probably been 20,000 tons more than the apparent consumption, making the falling off only 17,478 tons. One of the disadvantages the syndicate labor under is that they have to carry the stock of Copper usually held by the trade."

Tin.—The London market has again slightly given way with Spot Tin since our last report, the same declining from £97 to £96. 15/ in the London market, futures remaining unaltered at £97 sterling. There has been some increase of activity in our own market, 10 tons of January selling at 21.80¢; 50 tons February at 21.55¢ @ 21.65¢; 35 tons April at 21.60¢ @ 21.70¢; 10 tons May at 21.80¢; 10 tons, spot, 21.50¢, and this morning 10 tons, spot, at 21.60¢. As the day after tomorrow the statistics for January will be cabled, the market closes to-day quieter and in an expectant attitude. **Tin Plates.**—The market has been quiet, but steady, with more inquiry for both spot and futures, which will probably lead to business in the near future. We quote large lines per box: Siemens-Martin Steel, Charcoal Finish, \$4.75 @ \$5.50; Ternes \$4.12½ @ \$4.25; Coke Tins, \$4.22½ @ \$4.30, and Wasters, \$4.12½ @ \$4.15. Liverpool Coke rules 18/ to 13/3. The Board of Trade returns for Tin Plates exported to the United States last year were 292,623 tons, as compared with 268,355 tons in 1887.

Lead.—A featureless state of affairs has prevailed during the week, sales not exceeding 400 tons at 3.75¢ @ 3.80¢, the closing quotation being 3.75¢, at which the market winds up with a dull feeling. Out West the quotation was 3.52¢ @ 3.55¢, with quite a dull state of affairs. In London Soft Spanish has remained steady at £12. 17/6, while English Pig receded from £13. 5/ to £13 sterling. The Lead exportations during the last 11 months of last year from Spain amounted to 118,737 tons, against 121,637 tons in 1887 and 103,149 tons in 1886.

Spelter.—Although inactive, our own market remains firmly sustained at 5¢ for Common Domestic, but in London quite a break seems to have occurred in Silesian, which fell from £18. 7/6 to £17. 15/, but this latter quotation lacks confirmation, and seems doubtful, unless there should be some hitch in the negotiations about the renewal of the syndicate to date from July next. But however this may be, for the moment the quotation of Spelter is altogether nominal. The export of Calamine from Spain during the first 11 months of last year was 24,643 tons, against 21,873 tons in 1887 and 25,009 tons in 1886.

Antimony.—A cable from England states that Ore has become extremely scarce, causing an advance in Hallett from £45 to £46, while here there was little

Antimony available and a good demand. We quote Hallett 11.25¢ and Cookson 13.25¢.

Everett & Post, dealers in Lead, Spelter and Copper at Chicago and St. Louis, have opened a branch office at 104 John street, New York, where they will be represented by Henry F. Salyards. With offices in these three important centers of the metal trade, their facilities for the transaction of business in the lines in which they operate will be very great, and will doubtless be duly appreciated by their customers.

New York Metal Exchange.

The following sales are reported:

THURSDAY, January 24.	
10 tons Tin, February.....	21.55¢
10 tons Tin, May.....	21.80¢
10 tons Tin, February.....	21.65¢
66 tons Lead, March.....	3.85¢
25,000 lb Lake Copper, March.....	17.00¢
FRIDAY, January 25.	
10 tons Tin, spot.....	21.50¢
10 tons Tin, April.....	21.70¢
16 tons Lead, January.....	3.80¢
SATURDAY, January 26.	
10 tons Tin, January.....	21.80¢
30 tons Tin, February.....	21.55¢
MONDAY, January 28.	
16 tons Lead, spot.....	3.80¢
25 tons Tin, April.....	21.60¢
TUESDAY, January 29.	
25,000 lb Lake Copper, March.....	16.00¢
WEDNESDAY, January 30.	
25,000 lb Lake Copper, March.....	16.40¢
10 tons Tin, spot.....	21.60¢

Financial.

Among current events bearing on business relations generally the meeting of railroad presidents in Chicago probably has most weight. After several days' deliberation the conclusions reached are believed to be in all respects favorable touching the general question of railroad management, settling of disputes, paralleling roads, &c., with the special object of preventing ruinous competition. The agreement, it is presumed, will be immediately ratified and put in force, thus consummating the measures proposed at the initial meeting of bankers and presidents held in this city at Pierpont Morgan's. Chairman Judge Cooley, of the Interstate Commerce Commission, says, in so many words, that rate-cutting must stop and the law be obeyed. Referring to the Chicago meeting, he remarked: "The question of maintaining rates resolves itself into a question of maintaining the law. The presidents know this, and any doubt by them as to whether they will pass and live up to an agreement is simply a doubt as to whether they will obey the law. Take the case of the so-called rate war between St. Louis and New York City. * * * Law and right were put aside until the fray was over. Now, the presidents know such actions as these must be stopped. There is no question to the Commission as to how it shall be done. It simply must stop."

The Stock Exchange markets have been generally dull, but strong, with considerable buying on foreign account, and Atchison most conspicuous. Reports from the conference at Chicago were anxiously awaited from day to day, and on Thursday the bearish demonstrations were renewed, and the grangers were attacked, in the expectation that they would suffer because of the decision of Judge Brewer, which sent to the State courts the cases of violation of the Iowa railroad laws. The market opened strong on Saturday, but free selling of Atchison, of Texas Pacific and of Richmond Terminal had an unsettling effect. On Monday stocks opened strong, influenced by better markets in London, indicating that the Boulanger election in Paris had little dis-

turbing effect, but a fall in Atchison, Topeka and Santa Fe in Boston encouraged free selling here. At a later hour news came that the railroad presidents at Chicago had satisfactorily ended their labors. Upon this the market advanced sharply and closed strong. On Tuesday there was an improved movement. At the close news came that the Chicago, Burlington and Northern had made a new demand at the presidents' meeting, and might cause a delay in signing the agreement.

The bond market was buoyant, under a heavy investment demand, and United States bonds are strong at quotations as follows:

U. S. 4½, 1891, registered.....	109
U. S. 4½, 1891, coupon.....	109
U. S. 4½, 1907, registered.....	123
U. S. 4½, 1907, coupon.....	123
U. S. currency 6s.....	12

The bureau report of foreign commerce for December shows the exports of merchandise to have been of greater value than during any previous month since December, 1884. Merchandise to the value of \$85,755,481 was exported, in comparison with \$78,229,551 in December, 1887. The December imports of merchandise were valued at \$60,488,104, also the largest record for any December of recent years. At the close of November the excess of merchandise imports over exports for the year had been \$58,700,000, but the December returns reduce the adverse balance to \$33,458,000. This excess of merchandise imports over exports is more than counterbalanced by the excess of our exports of coin and bullion over our imports.

Accounts respecting general trade are variable. Wagon roads in the West and other sections of country have been abominably bad for several weeks past. On the other hand, mild weather has permitted navigation on the Hudson and on the lakes to an extent rarely experienced for many years, and railroads have been free from obstruction. Taking all in all, winter trade has been disappointing, and in several descriptions of merchandise the full prices reasonably expected at this season of the year have not been realized. In breadstuff: there is no life, and holders of flour have been compelled to accept lower prices, despite the curtailment of production. Cables from Europe, too, are dispiriting. The decline in wheat was about 1½¢. For corn shippers manifest little urgency. Stimulated by lower prices exports of provisions from the seaboard last week comprised 8,500,000 pounds of bacon, a gain of 1,000,000 pounds on the corresponding week last year, and freight room is wanted for cotton. In dry goods business is more extended, but conservative, and the tone exceptionally strong. As the week closes, the great tie-up of nearly all the horse-car railways in New York and Brooklyn tends to embarrass local movements in every direction.

The total clearings of 39 cities last week show an increase of 17 % over the corresponding week last year. In New York the gain was 18.9 %; outside of New York 13.7 %. At no point is there a noticeable decrease, while in the Northwest there is almost uniformly a large increase, ranging as high as 56.5 % in Denver City. A very fair increase is noted at the principal seaboard cities, including Boston, Baltimore and Philadelphia, in the order named.

The weekly statement of the New York banks was again favorable, if the continued accumulation of funds at this center can be so regarded. The increase of reserve was \$1,985,250, making the present surplus \$20,012,360, against \$23,258,825 at the corresponding time last year, and \$22,298,250 in the fourth week of January, 1887. The gain of only a few weeks past has been considerably in excess of 100 per cent. In loans there was an expansion of

\$3,496,400. Specie increased \$2,881,500, and legal tenders increased \$975,500. Deposits increased \$7,487,000, and circulation decreased \$90,300. Some of the savings banks were desirous of placing money on government security at 2½ % for four or five months. Commercial paper was dull. Rates are 4 % for 60 to 90 day indorsed bills receivable; 4½ to 5 for four months' acceptances, and 5 to 6 for good single names having from four to six months to run.

The Secretary of the Treasury on Saturday purchased \$521,000 4½ % bonds at 109. The total amount of bonds purchased to date under the circular of April 17 is \$108,917,800, of which \$51,396,650 were 4 % and \$57,521,150 were 4½ %. The total cost of these bonds was \$128,284,759, of which \$66,101,877 was paid for the 4 % and \$62,182,882 for the 4½ %.

Sterling exchange was firm at \$4.87 @ \$4.89½, and a shipment of \$1,000,000 in gold was made on special order. The Bank of England and the Bank of France reduced their sales of discount from 4 to 3½ %. In the present state of the market gold exports from New York as an ordinary exchange transaction yield no profit.

The new Ganesvoort Bank, Fourteenth street, junction Hudson and Ninth avenues, opened for business on Monday.

Henry S. Ives and George H. Stayner, the Cincinnati, Hamilton and Dayton financiers, were lodged in the Ludlow street Jail, being unable to obtain \$250,000 bail each.

The eastbound shipments from Chicago by the trunk lines last week amounted to 56,509 tons, against 61,840 the previous week and 45,047 tons for the corresponding period in 1887.

British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, January 30, 1889.

The Copper market has been very irregular and unsettled. Up to Saturday last the syndicate agents were bidding £77. 5/ for Chili Bar and G.M.B. prompts and £75 for futures, at which prices very little supply came out. Subsequently they withdrew as buyers of spot stock, but kept standing offers of £75 for futures. Coupled with the decline in price of Rio Tinto shares from 22 to 19½ francs, which was attributed to free selling on orders from Paris, the withdrawal of syndicate support led to a decline to £72. 15/ on prompts, and a considerable amount of G.M.B. was thrown over by outside holders. The decline in Rio Tinto shares led to rumors that the syndicate was on the verge of collapse, and the possibility of that being the case was strengthened by the announcement that negotiations between the Copper Bank and the mining companies were meeting with greater trouble than had been anticipated, more particularly in the instance of the dealings with American companies. To-day the syndicate agents came to the relief of the market and bid up to £87. 10/ for prompts, while not going above £75 on futures; but transactions were reported at as low as £73 for spot and £70 for futures between operators who refused to trade with syndicate agents. Sales of Best Selected were reported at £76 and under. There is no improvement in the demand from consumers, and deliveries continue surprisingly small. Old Copper is offering in larger quantities, and at somewhat lower prices, in the face of announcements

latterly that the supply had been pretty well cleaned up.

Block Tin has depreciated somewhat in value, mainly under the influence of the decline in the price of Copper. The feeling, however, is that the market is in better form, the demand for consumption being fair and the offerings by large operators moderate.

The demand for Tin Plate has been rather slow, owing in part to the refusal of makers to grant concessions on prices. A meeting of makers has been called for the purpose of combining with a view of bringing about a more satisfactory adjustment of railway freight rates. A new works at Langenneck has been projected.

Welsh Steel makers, who have been most prominent in connection with the proposed Steel Rail combination, have advanced their prices and declare that the syndicate will soon fix a uniform price of £4. 15/ for standard sections. The railway companies manifest unmistakable displeasure at the project and threaten to discontinue purchases. Some extensive contracts are under negotiation at the present time.

Speculation in Pig Iron Warrants has been brisker, and the market has shown more tone, although prices have fluctuated somewhat irregularly under the contest between "bulls" and "bears." The "bear" interest seem determined to resist any advance in view of the large stocks in store. The "bulls" express confidence, claiming that the oversold accounts are heavy and the stocks in makers' hands diminishing. Steamer freights from Glasgow to New York are held higher, the steamship agents now quoting 5/. There have been very few and only slight changes in prices for makers' brands, or on Mid-dlesboro' Pig or Hematites.

Steel of all kinds is held very firmly, and a fairly good business is reported in most lines. Makers ask 2/6 advance on last week's prices for Billets and Wire Rods.

An improved demand for Old Iron Rails is reported, but buyers and sellers are considerably apart on prices.

Scotch Pig.—A fair business reported, with prices steady for most brands:

No. 1 Coltness, f.o.b. Glasgow	51/
No. 1 Summerlee, " "	50/6
No. 1 Gartsherrie, " "	48/
No. 1 Langloan, " "	49/8
No. 1 Carnbroe, " "	48/8
No. 1 Shotts, " at Leith	49/
No. 1 Glengarnock, " Ardrossan	47/6
No. 1 Dalmeilington, " "	48/
No. 1 Eglinton, " "	47/6
Steamer freights, Glasgow to New York, 4/	
do 5/; Liverpool to New York, 10/.	

Cleveland Pig.—More activity in this branch and prices very steady. No. 1 Mid-dlesboro', G. M. B., 36/8; No. 3 do., 33/9 @ 34/.

Bessemer Pig.—There continues to be a good business and prices remain steady. West Coast brands, mixed numbers, 45/, f.o.b. shipping point.

Spiegeleisen.—The market very firm and demand fairly active. English 20 % quoted 80/, f.o.b. N. W. England shipping point.

Steel Rails.—The demand less active than last week, but makers firm on prices. Heavy sections quoted at £4, and light sections £4. 2/6 @ £4. 12/6, f.o.b. at N. W. England shipping point.

Steel Blooms.—A fair business passing at steady prices. We quote £3. 18/6 for 7 x 7, f.o.b. at N. W. England shipping point.

Steel Billets.—The demand fairly active and prices firm. Bessemer, 2½ x 2½ inch, £4. 3/9 @ £4. 5/, f.o.b. at N. W. England shipping point.

Steel Slabs.—Only a moderate business and prices nominal. Bessemer, £3. 18/6, f.o.b. at N. W. England shipping point.

Old Rails.—There has been a very fair demand. Holders are firm. Tees quoted at £3. 5/ @ £3. 6/, and Double Heads, £3. 8/ @ £3. 10/, c.i.f., New York.

Scrap Iron.—The market steady but quiet. Heavy Wrought quoted at £2. 2/6 @ £2. 5/, f.o.b.

Crop Ends.—Moderate sales and prices unchanged. Bessemer quoted £2. 10/ @ £2. 12/6, f.o.b.

Tin Plate.—Very little change, buyers and sellers being apart. We quote, f.o.b. Liverpool:

IC Charcoal, Allaway grade	15/3 @ 15/6
IC Bessemer steel, Coke finish	13/6 @
IC Siemens	13/9 @
IC Coke, B. V. grade	13/3 @
Charcoal Terne, Dean grade	12/ @ 12/6

Tin.—A very fair business during the week, and the market showing better tone. Straits quoted at £96. 15/, spot, and £97. 7/6 @ £97. 10/ for three months' futures.

Manufactured Iron.—The market firm all through and fairly active. We quote, f.o.b. Liverpool:

Staff. Ord. Marked Bars	£ s. d.	£ s. d.
" Common	8 2 6	5 15 0
Staff. Bl'k Sheet, singles	7 15 0	6 17 6
Welsh Bars (f.o.b. Wales)	5 0 0	6 2 6

Copper.—The market has been irregular and unsettled, but showing more firmness to-day, though quieter. Chili Bars nominal at £77. 10/, spot, and £75 three months' futures. Best Selected, £76.

Lead.—Market very slow, and prices rather weak. Quoted at £12. 7/6 for Soft Spanish.

Spelter.—The demand light and prices weaker. Quoted at £17. 15/ for ordinary Silesian.

Foreign Markets.

EQUIVALENTS.

Franc, Peseta or Lira	Cents
Florin (Netherlands)	19.3
Florin (Austria)	40.2
Florin (Austria)	35.9
Escudo (Portugal)	11.02
Milreis (Brazil)	25.5
Mark (Germany)	25.5
	Pounds
Allogram	2.305
Picul	134.

ARGENTINE REPUBLIC.

BUENOS AYRES, December 13, 1888.—*Dynamite.*—A company has been formed in this city for the manufacture of Dynamite, the Fabrica Nacional de Dinamita, with a capital of \$1,000,000, the manager to be Umberto della Casa, and the chairman of the board of managers Augustin Silveyra. Nitric Acid and Chemicals generally will also be made—*La Tribuna*.

CHINA.

HONG KONG, December 4, 1888.—*Steel.*—Sir R. Hart, the Inspector-General of Customs in China, has fixed the duty on Mild Steel at 0. 1, 2, 5 taels per picul to date from January 1, 1889, the same as on Finished Iron, while hitherto the duty was twice that much. *Argenti-ferous Lead.*—The two important mines at Jeho, 150 miles north of the Chinese Wall, in Mongolia, have been vigorously taken in hand by orders received from Li Hung Chang, and are now successfully being worked by American mining engineers for Government account upon modern principles.—*Argus*.

AUSTRALIA.

SYDNEY, N.S.W., January 9, 1889.—*Metals.*—The December shipments from Australia to England comprised 1500 tons of Tin, and 9000 tons of Copper Ore.—*Per cable via London*.

EAST INDIES.

SINGAPORE, December 17, 1888.—*Tin.*—Our last report was dated 4th inst., since when only

a moderate business has been done at down to \$37, and the market closes weak with sellers at this price. Buyers offer \$36.75. Supplies have been kept back by rains up-country. Tin has been booked at 30/, via Cape. The Flora P. Stafford sailed. No further feature is reported. *Boston*—The Antioch and Penobscot are both loading for this port. *Exchange* is steady at 3/2½ for six months' sight credits. There were shipped from the Straits Settlements to the United States during the first 11 months, 55,072 piculs of tin, against same time in 1887, 60,570; in 1886, 66,873; in 1885, 37,068; in 1884, 55,279; and in 1883, 106,231. P. S. per cable January 17, 1889: Tin shipments to the United States during the first fortnight of the month have been from Singapore and Penang 300 tons, against 150 in 1888; to England, 600, against 1400.—*Giffman, Wood & Co.*

PENANG, December 12, 1888.—*Tin.*—Receipts during the fortnight amounted to 9500 piculs, of which Europeans took 5340 and Chinese 4000. Opening at \$37.55, the market closed after a few fluctuations at \$37.55, after some purchases at \$37.25. *India-Rubber.*—A small lot was paid \$69.50 per picul. *Exchange.*—We quote four months' sight, bank, 3/1½ @ 3/1¼.—*Schmidt, Kusterman & Co.*

COLOMBO, CEYLON, December 13, 1888.—*Plumbago.*—A steady, moderate demand has been noticeable at following quotations: Large Lumps, ½ ton in rupees, 145 @ 170; Ordinary ditto, 125 @ 160; Chips, 80 @ 95, and Dust, 40 @ 65. Plumbago shipments to England, 15,434 tons; to Hamburg, 851; to Antwerp, 1027; to India, 21; to Australia, 88, and to the United States, 22,209; together 39,630, against 51,026 in 1887; 55,066 in 1886, and 34,550 in 1885. *Exchange.*—Six months' sight, 1/4½.—*Volkart Brothers, through their agent, Mr. John W. Greene, 82 Wall street, New York.*

MANILA, January 21, 1889.—*Hemp.*—There are buyers at \$15.15-16 per picul against same date 1888, \$9½, equaling ½ ton cost and freight £54. 15/ against £33. 5/; clearances for the United States since last cable amount to 4000 tons, against 7000 in 1888; since January 1, to 24,000, against 13,000; loading for do., 28,000, against 7000; cleared for England since January 1, 11,000, against 5,000; loading for do., 3000, against none; cleared for all other ports, 2000, against 3000; receipts at all ports since last cable, 10,000, against 13,000; do. since January 1, 29,000, against 26,000 in 1888 and 27,000 in 1887. *Freight.*—\$7.50 against \$5.50. *Exchange.*—3/8½, against 3/8.—*Ker & Co., per cable direct, to their agent, Mr. Charles Nordhaus, 89 Water street, New York.*

SWEDEN.

STOCKHOLM, January 17, 1889.—*Machine Made Nails.*—Swedish makers have formed a syndicate for the control of output and prices, and a sales office is opened in this city under the management of the firm of L. L. Liberg. *Iron Ore.*—The Government has resolved not to acquire the Lulea-Ofoten Railroad, taking umbrage at the demand of the latter that no export duty be imposed on its Iron Ore in the future.—*Dagbladet*.

GERMANY.

HAMBURG, January 19, 1889.—*Iron.*—All sorts of Pig Iron have been in active request, and the home and export demand for Spiegel is such that the price has advanced uninterruptedly, 10 @ 12½ now being worth 59 marks per ton. Forge Pig is also tending upward, and makers decline naming a figure for the second quarter. The Rhemish-Westphalian syndicate raised the price on the spot 1 mark, so that Thomas is now held at 46 and German Bessemer at 55. Foundry is also better, the range being 54 @ 61; Luxembourg, 35.70 @ 41; Finished Iron has followed suit and improved 2½ marks. A good spring trade seems to be in prospect throughout the Iron and Steel branches. The American demand for Wire Rods has also revived; the same may be quoted 106 @ 107 marks; Steel Rails, 120 @ 125; ditto for mines, 110 @ 115.—*Borsenhalle*.

BELGIUM.

BRUSSELS, January 19, 1889.—*Iron.*—The Belgian Iron market generally remains in good position. Although the orders dropping in might be larger, they nevertheless sum up a decent aggregate—sufficient to keep all things going. Orders for Steel Rails have been on the increase. The number of blast furnaces in operation is the same as it was during December. Out of 50 in Belgium 19 remain blown out. December production has been large. Pig, 54,870 tons; Foundry ditto, 4185; for Steel making, 16,585 tons—together 75,640 tons. Pig Iron consumption in November was 79,354 tons. During the first eleven months of 1888 we exported 62,749 tons of Steel Rails, against 65,323 in 1887.—*Moniteur des Interets Matériels*.

Wages have been reduced by many boot and shoe makers in New England during the last six months.

Hardware.

There is an evident improvement in business, of which there is a fair amount doing in a quiet way. Travelers' reports indicate a good condition of things throughout the country generally, and it is expected that a good business will be done in the near future. Prices are without material change, and while concessions are being made on some lines, in others there is an improved tone. The general situation is regarded as promising well for the season's business, the principal complaint on the part of manufacturers being the very narrow margin of profit on most lines.

Cut Nails.

The official report of W. E. S. Baker, Philadelphia, Secretary of the Atlantic States Nail Association, shows the following figures for the monthly production of Nails in the 27 mills of the association, whose aggregate number of machines is 1880:

Months.	1887. Kegs.	1888. Kegs.
January.....	268,748	179,411
February.....	271,290	193,367
March.....	292,145	233,216
April.....	221,139	199,151
May.....	147,463	219,888
June.....	201,631	216,410
July.....	131,497	180,300
August.....	211,646	208,585
September.....	244,750	206,478
October.....	247,170	248,743
November.....	239,284	195,539
December.....	222,829	174,382

Totals..... 2,699,592 2,405,470

These figures compare as follows with previous years:

	Kegs.	Kegs.
1884.....	2,253,917	1887..... 2,699,592
1885.....	2,743,318	1888..... 2,405,470
1886.....	2,863,268	

The stocks were for a series of years:

Stocks of Cut Nails.

January 1, 1885.....	245,550 kegs.
January 1, 1886.....	306,556 kegs.
January 1, 1887.....	241,864 kegs.
January 1, 1888.....	330,986 kegs.
January 1, 1889.....	389,834 kegs.

The report of the product of the Atlantic States Association, given above, does not include several small works with an estimated product of 68,000 kegs, making the total output 2,473,470 kegs. Last year, with allowance for mills not reporting, the total was made 2,727,734 kegs for the Eastern mills.

Business is moderately active in the New York market, with quotations unchanged at \$1.80 @ \$1.90 for carload lots and \$1.90 @ \$1.95 for small lots from store.

The regular monthly meeting of the Western Cut Nail Manufacturers' Association is being held at Wheeling, W. Va., to-day.

Wire Nails.

The market remains in substantially the same condition as at our last report, with a further improvement, as the extreme prices recently prevailing have been quite generally withdrawn. A large amount of orders has been placed, and the mills are consequently not as solicitous of making sales. Quotations remain as before on a basis of about \$2.30 at mill, with the usual advances for small lots from store.

Barb Wire.

The New York market presents no new features, prices being pretty well maintained, but to a large extent nominal, as transactions are limited.

Advices from the West make it questionable as to whether the recent understanding reached by the St. Louis manufacturers, as referred to in our last issue, will result in securing regularity in prices,

as it is reported that one of the parties has practically withdrawn from the arrangement.

An important fact has just been made public in connection with the pending and apparently interminable litigation over the Barb Wire patents. Some time since, in a suit with the Washburn & Moen Mfg. Company, the Beat-em-all Barb Wire Company, of Cedar Falls, Iowa, were victorious, establishing by testimony the use of Barbs on Wire used for fencing prior to the date of the patents. It now transpires that one of the witnesses, whose testimony largely aided in establishing prior use, has signed an affidavit that his statements were incorrect. This affidavit is in the possession of the Washburn & Moen Mfg. Company's attorneys. Several members of the family of another witness have made affidavits that his statements also were incorrect, though he has refused to make such an affidavit. Sensational as these statements are, we are assured of their truth by those in a position to know all the facts. An aggressive movement on the part of the owners of the patents is looked for at an early day, as it is not likely that they will lose much time in following up the opportunity which these disclosures give them to have the verdict against them set aside. When that is done they will vigorously prosecute their suits for infringement.

Miscellaneous Prices.

It was decided by the manufacturers of Picks and Mattocks, to whose conferences with a view to advance in price we referred in our last issue, to hold their meeting at an earlier day than was first intended, in order that they might effect the change in prices without too great an accumulation of orders. The meeting was accordingly held last week, instead of this week, as originally intended, and prompt action was taken, forming a strong combination and advancing prices from 15 to 25 per cent. on the different lines of Picks and Mattocks. It is understood also that the new prices will as far as practicable, apply to orders received since January 1, so that the manufacturers may be unembarrassed by the presence on their books of orders at the old figures, which would tend to give a good deal of irregularity to the market. As it is, it is thought that less than the usual quantity of orders were placed at old prices in anticipation of the advance. The wisdom of the manufacturers in this action is generally conceded by the trade.

The combination on Iron Rivets does not on the surface develop striking irregularities, but concessions beyond the regular prices are made by some of the manufacturers, and there are other indications of irregularities.

Another advance has been made in the prices of Rope, the manufacturers' quotations now being subject to a discount of 1 1/2 % for cash in 10 days:

	Per pound
Manila, 1/4 inch and larger.....	15 1/4c
Manila, 3/8 inch.....	15 1/4c
Manila, 1/2 and 5-16 inch.....	10 1/4c
Manila, Tarred Rope.....	14 1/4c
Manila, Hay Rope.....	15 1/4c
Sisal, 1/4 inch and larger.....	13 1/4c
Sisal, 3/8 inch.....	13 1/4c
Sisal, 1/2 and 5-16 inch.....	12 1/4c
Sisal, Hay Rope.....	14 1/4c
Sisal, Tarred Rope.....	12 1/4c
Sisal, Medium Lath Yarn.....	12 1/4c

Both Cast and Wrought Butts are in an unsatisfactory condition and prices are irregular and low. In Wrought Butts there is an animated competition between two of the manufacturers, the other manufacturers not being so active participants.

The Screw market is in a very satisfactory condition and prices are well adhered to by the manufacturers. They report that the indications are that the stocks

purchased by the jobbers at the old prices are pretty well broken, as most of them are purchasing goods at the new prices. That the old stocks have lasted to the present time is a striking evidence of the great quantity of Screws that was purchased previous to the advances.

The Skein manufacturers, at a meeting held in Chicago January 3, 1889, adopted a revised standard list, as follows:

Standard Steel Skein List with Either Nuts or Linch Pins.

To fit size.	Per set.	To fit size.	Per set.
2 1/4 x 7.....	\$3.60	3 1/4 x 11.....	\$8.50
2 1/4 x 7 1/2.....	5.70	3 1/4 x 12.....	9.00
2 1/4 x 8.....	5.80	3 1/4 x 11.....	10.00
2 1/4 x 8 1/2.....	6.10	3 1/4 x 12.....	10.00
2 1/4 x 9.....	6.20	4 x 12.....	12.00
2 1/4 x 9 1/2.....	6.30	4 1/4 x 12.....	13.00
3 x 9.....	6.50	4 1/4 x 12.....	17.00
3 x 10.....	6.70	4 1/4 x 13.....	18.00
3 1/4 x 9.....	7.40	5 x 14.....	23.00
3 1/4 x 10.....	7.50	5 1/4 x 14.....	25.00
3 1/4 x 11.....	7.60	6 x 15.....	27.00
3 1/4 x 10.....	8.30	6 1/4 x 18.....	30.00
3 1/4 x 10 1/2.....	8.40		

From the above list the Columbus Mfg. Company, Columbus, Ohio, announce the following discounts:

Rocky Mountain brand, 40 per cent.
Columbus brand, 40 and 10 per cent.

The following is their price list of Hub Boxes, seamless and interchangeable, which is subject to a discount of 50 per cent.:

To fit size.	Per set.	To fit size.	Per set.
2 1/4 x 7.....	\$0.66	3 1/4 x 11.....	\$2.18
2 1/4 x 7 1/2.....	.75	3 1/4 x 12.....	2.25
2 1/4 x 8.....	.84	3 1/4 x 11.....	2.37
2 1/4 x 8 1/2.....	.90	3 1/4 x 12.....	2.40
2 1/4 x 9.....	1.05	4 x 12.....	2.49
2 1/4 x 9 1/2.....	1.20	4 1/4 x 12.....	2.70
3 x 9.....	1.32	4 1/4 x 12.....	3.66
3 x 10.....	1.50	4 1/4 x 13.....	3.93
3 1/4 x 9.....	1.62	5 x 14.....	4.11
3 1/4 x 10.....	1.74	5 1/4 x 14.....	5.46
3 1/4 x 11.....	1.83	6 x 15.....	6.60
3 1/4 x 10.....	1.92	6 1/4 x 18.....	10.20
3 1/4 x 10 1/2.....	2.01		

The following are revised quotations of the Boston and Lockport Block Company, Lockport, N. Y., on their line of Faucets:

	Discount.
West's Lock, Open and Shut Key.....	50 %
Star, Metal Plug.....	40 %
Lockport, Metal Plug.....	60 %

They call attention to the fact that their lists are lower than those of some other makers, new or revised lists having been also recently adopted for some of the goods. They have discontinued making their Anchor Lock Faucet.

The Freeman Wire Company, St. Louis, Mo., are quoting the following prices on their Wire, Barbed Wire, Staples, &c.

2 or 4 Point Painted Barbed Wire, in Cattle or Hog.....	\$2.90
2 or 4 Point Galvanized Barbed Wire, in Cattle or Hog.....	3.50
In less than car lots, the price is \$3 for Painted, \$3.60 for Galvanized.	
No. 9 Annealed Smooth Wire.....	\$2.40
Nos. 10 and 11 Annealed Smooth Wire...	2.50
No. 12 Annealed Smooth Wire.....	2.60
With 60 cents advance for Galvanized.	
No. 14 Annealed.....	2.90
No. 15 Annealed.....	3.05
No. 16 Annealed.....	3.20
With 75 cents advance for Galvanized.	
Annealed or Plain Staples.....	2.75
Galvanized Staples.....	3.50

The Super-or Saw Sets, manufactured by the American Tool Company, Canton, Ohio, are listed at \$15 per dozen, and are subject to a discount of 50 per cent.

Accuracy in Tape Measures.

Referring to a paragraph which appeared in a recent issue of this paper in regard to inaccuracies in a well-known line of English Tape Measures, we have the following communication from George M. Eddy & Co., leading American manufacturers of these goods, in which it will be seen that they maintain the correctness

of the position of their English competitor, insisting that minute accuracy cannot be expected in woven Tapes under the many conditions in which they are used, and the different influences of moisture, temperature, &c., to which they are subjected. As giving the judgment of an expert in this line our correspondent's views are entitled to weight and the trade will be enabled to judge intelligently of the degree of accuracy which is to be expected from common Tapes, looking for exactness in measure to the Steel and other high-priced Tapes in which this is secured:

Our attention has been called to a paragraph in *The Iron Age* of the 10th inst., page 65, on the subject of the inaccuracy of some English Measuring Tapes. The English manufacturer was entirely correct in his remarks. Although the Tapes are printed from a correct standard it is impossible to expect that they will remain so under all conditions. The variations of the weather affect all woven Tapes. If printed in damp weather they will shrink more than when it is dry. Again, if used in damp or wet weather they will stretch and contract again when dry. If used for some purpose, as, for instance, measuring green timber or wood, then will shrink remarkably as they absorb the tannic acid in the wood. Have found them to shrink as much as 8 inches in 50 feet, after being used sometimes for that purpose. No woven Tapes can be relied on for standard measure. The only standard of considerable length is the Steel Tape under all conditions. The only variations are the differences of temperature, which are uniform and well known to engineers and others accustomed to use them. The steel Tapes are graduated to a standard of 62 degrees, and the variations are 0.08 inch in 100 feet for every 10 degrees F. above or below that standard. They are standard measures and will remain so in use. If broken can be mended at small expense. A spring balance for uniform strain with level attachment can be used when great exactness is required. They have become indispensable for a great variety of purposes and the demand for them is constantly increasing. Our experience of over 40 years in this business enables us to speak with confidence on the subject.

Items.

The Chicago Spring Butt Company have just issued their catalogue for 1889, in which they continue their usual yearly improvements in their line of specialties and their habitual addition of new goods. They have taken a step in advance in giving list prices for Japanned, Common Bronzed, Nickel-Plated Springs and Tips, Bronze-Plated Springs and Tips, Ground Opal Bronzed, Nickel-Plated, Bronze-Plated, Iron Oxidized Antique, Bower-Barff, Iron Oxidized Silver, Bronze Metal, Polished Brass, Bronze Metal Antique, and Bronze Metal Oxidized Silver. These are all subject to a regular discount, thus avoiding the confusion and perplexity experienced when some uncertain net amount has to be added for odd finishes to the discounted amount of an ordinary list. This extra amount for finishes is also usually obtained by writing specially for it, which is another troublesome matter obviated by the company's catalogue. Their new Double-Acting Door Check Latch is decidedly novel, and their new Screen Door Hold-Back Hinge has the Spring placed behind the Hinge, so that it hardly appears to be a Spring Hinge. The telegraph code of their leading goods will undoubtedly prove convenient, as a variety of goods can be ordered in a ten-word telegram. As their Fire-engine House Hinge is not kept in Stock by the smaller trade, a full-sized cut of it is pasted in the catalogue, which will be found a useful aid in selling the hinge without having to keep a sample of it.

Rockford Cutlery Company, Keokuk, Iowa, formerly of Rockford, Ill., at the election held January 15th, elected the following officers: C. E. Phillips, president, C. J. Stegmaier, vice-president; W. S. Phillips, secretary and treasurer. C. H. C. Burlingame, the retiring manager, held that position for nearly five years, and is

succeeded in that capacity by W. S. Phillips. The company have made some alterations in their plant, and inform us they are in a position to fill all orders in a satisfactory manner.

M. McKercher & Co., 106 and 108 Wabash avenue, Chicago, have succeeded the Miller Mfg. Company in the manufacture and sale of Curd's Patent Brace Splice. They will also represent a full line of the Enterprise Mfg. Company's Rosettes and Harness Specialties. The new firm is composed of three young and enterprising men of ability and business experience.

The Vaughan & Bushnell Mfg. Company, 89 to 95 South Clinton street, Chicago, have issued a revised price list on their Special Wrought Goods, comprising Nail Grips, Nail Claws, Floor Hooks, Grappling Hooks, Sash Weight Rings, Eye Bolts, Swing Bolts and Rings, Well Wheel Hooks, Heavy Hasps, Ice Tongs, Hitching Rings, Leader Hooks, Post-hole Augers, &c. It is a handsomely illustrated and finely printed pamphlet of 16 pages.

The annual meeting of the stockholders of the Wheeling Hinge Company, of Wheeling, W. Va., was held on Tuesday, the 22d inst., at which the old Board of Directors was re-elected.

The Grand Rapids Refrigerator Company, Grand Rapids, Mich., are preparing a new art catalogue, which is intended for general distribution. In it they give a very interesting series of pictorial sketches. It is not simply an illustration of different patterns of their Refrigerators, though these are given, but there are a number of sketches artistically designed of subjects connected with their Refrigerators, the formation, gathering and making of ice, which are effectively printed in color, and embody in the legends connected with them something of a love story. The pamphlet is intended for distribution by the trade to their customers, and will doubtless serve its purpose well, as it is so gotten up as to be of real interest, while it calls attention on its alternate pages to the Leonard Refrigerators. The back page in the copy before us is left blank and is intended to receive the card of the merchant. It is accompanied by a circular in which the company request the merchant to whom it is sent to indicate the number of copies which he can distribute, which will be furnished free of charge. As an instance of advertising enterprise this departure on the part of the company is deserving of commendation, and will doubtless result in bringing their Refrigerators in a very attractive manner to the attention of a largely increased number of purchasers of such goods.

The Chattanooga Tool Company, Chattanooga, Tenn., issue a neat catalogue describing their line of Rakes, Drain Cleaners, Mallets and Handled and Eye Hoes, of which illustrations and list prices are given. They allude to the purchase, to which we have already referred, of the entire equipment, machinery, tools, patterns, dies, &c., together with the good-will, of the Hoe manufactory of M. Bare, Hamilton, Ohio, and the removal to Chattanooga of the skilled labor that operated it, as giving them, with the enlargement of their factory, greatly increased facilities for manufacturing their old line of goods, together with the full line of Eye Hoes made by Mr. Bare.

Paine, Diehl & Co., Philadelphia, Pa., are calling attention to their Keystone Culinary Whips and Mixers, a line which they are preparing to put on the market in large quantities.

The late firm of N. T. Bushnell & Co., New Haven, Conn., was dissolved January 1 by the retirement of Edward A.

Todd. The business will be continued under the same name by N. T. Bushnell, Arthur Griggs and William H. Burchell, who will settle up the business of the old firm.

The Avery Stamping Company, Cleveland, Ohio, issue a convenient pamphlet relating to their Patent Seamless Steel Elevator Bucket, of which a full description is given.

Among the special notices on page 47 will be observed one signed "A. K. J.," in which a desirable stock of Hardware, valued at \$9000, together with a Hardware business desirably located in the Indiana gas region, is offered for sale. Those desiring to engage in such an enterprise may obtain further particulars by addressing the advertiser.

Barrows-Savery Company, Philadelphia, Pa., in addition to their regular line of Hollow-Ware, are now making Enameled Maslin Kettles with patent lip.

Simmons Hardware Company, St. Louis, Mo., have issued their annual catalogue for the present year, in which they illustrate Children's Carriages, Wagons, Velocipedes, &c., Bicycles, Wheelbarrows, Refrigerators, Churns, the Perfection Vapor Stoves and other specialties. The Perfection Oven is also described, with illustrations showing its construction.

The Iowa Farming Tool Company, Fort Madison, Iowa, have issued their illustrated catalogue for the present season. It is characterized by the same elegant typographical features which have been found in their former issues, and shows their large line of Steel and Wood Goods in an attractive manner.

Ausable Horse Nail Company, 4 Warren street, New York, have appointed Duncan K. Major their Western representative.

Henry Hopkins & Co., publishers of Hopkins' "Handy Notes and Queries," 99 Reade street, New York, issue a small pamphlet in which many Hardware houses allude to its interest and utility.

The business heretofore conducted by A. J. Harwi, Atchison, Kan., has been incorporated, and will hereafter be carried on by the A. J. Harwi Hardware Company. The officers are as follows: A. J. Harwi, president; W. P. Mallory, secretary, and E. C. Harwi, treasurer. This is the commencement of the 15th year of the business, and the company will have the best wishes of the trade for their success.

The trade will observe the advertisement on page 46, in which Haydock & Bissell, No. 12 Murray street, New York, call attention to their sale of Hardware, House-Furnishing Goods, Edge Tools, Shovels and Spades, &c., on the 5th prox. Its importance will evidently justify the attention of the trade.

The Russia Cement Company, Gloucester, Mass., manufacturers of Le Page's Liquid Glue, announce that they have severed their connection with the firm of Tower & Lyon, and have secured the services of Maltby, Henley & Co., 20 Warren street, New York, by whom these goods will be supplied to wholesale Hardware dealers at manufacturers' prices. They also state that they have just completed an entirely new plant for the manufacture of Le Page's Glues, and are now able to fill all orders without delay. These works, which are referred to as the largest of the kind in the world, are capable, we are advised, of consuming 35 tons of raw material per day, the process employed having been recently improved under patents controlled by the company. The company have just issued a very neat display stand for the exhibition of their goods, which will doubtless be appreciated by the trade.

Rector & Wilhelmy Company, Omaha, Neb., are sending out a very neat and convenient pocket memorandum book. On the inside covers and the pages facing them they call attention to their specialties, including Jefferson Steel Nails, Austin and Crack Shot Powder, Cartridges, Wads, &c., Fairbanks' Scales, Western Washers, Indurated Fiber Ware, Peerless Handles, Jackson Steel Goods, Lane's Hangers and others. The body of the book is without any printed matter, rendering it admirably adapted to its purpose. They send it out with a courteous and business-like circular.

The Eco Magneto Clock Company, 105-111 Summer street, Boston, Mass., issue a convenient pamphlet describing their Eco Magneto Watchmen's Clock. This Clock is for the purpose of registering visits of the watchman to each station independent of all other stations, similarly to other electric Clocks, but contains the novel feature of being without a battery, as the electricity is generated from a small magneto at each station, similar in principle to a telephone call except that only one-fourth of a turn is necessary to make a record. This method of operating a watchman's clock is referred to as possessing important advantages from the fact that the record can only be made from a station, and that no other means of interfering with the circuit exists by which the record can be falsely made. A full description is given, with testimonials from parties who are using it.

The Penn Lock Works, Philadelphia, formerly located at No. 142 North Fourth street, have moved to No. 146 same street. Their facilities are now increased for the manufacture of Locks, Key Blanks, Locksmiths' supplies, Ice Creepers, &c.

The Nason Mfg. Company, 71 Beekman street, New York, prepared a convenient pocket book for containing papers and memoranda, which was sent out with the compliments of the season, and called attention incidentally to the fact that they are dealers in Pipes, Valves, Fittings, Boilers, Steam Engines, &c.

Pushing German Trade.

The English manufacturers are keeping a watchful eye upon their German competitors and note with natural jealousy any advances made by them in foreign markets. The enterprise shown by the German manufacturers of Iron and Hardware goods is acknowledged by their more conservative neighbors, and there is evidence that the fact that in several lines the Germans have stolen a march on their competitors and are using in all departments much skill and vigor in the extension of their trade is having its effect upon the English makers, and stimulating them to new efforts to hold the markets which they now occupy. The following editorial from the London *Ironmonger* refers to recent efforts made by the Germans in the way of gathering information in foreign markets with the intention doubtless of utilizing it for the extension of their trade:

The Germans are certainly to be credited with almost sleepless energy in their efforts to develop their foreign trade. Many of their methods of procedure have been already touched upon in these columns, but the latest of their efforts comes before us from Constantinople. At that place the German Consul-General has issued a circular and a series of tabulated sheets, with blank spaces to be filled in, in order to ascertain the amount of business done in German goods by the different merchants, &c., to whom the circular is addressed. The circular is in French, while the list of goods is in German and French, printed in parallel columns. The list is most exhaustive, and comprises almost every kind of merchandise, including Iron and Steel of all kinds, Hardware of every variety, Machinery and Machine Tools, Cutlery, Nails, Agricultural

Implements, Locks, Oils and Colors, Needles, Lamps, Copper, Zinc, &c., work, Guns and Ammunition, &c. The circular and list have been sent out in a thoroughly systematic manner, and as the information asked for is certainly of the most confidential character, the Consul-General promises *la plus grande discrétion* shall be observed in dealing with it. The precise object of the German Government in thus obtaining the information direct from the traders, instead of from the Turkish authorities, does not appear, but as it is pretty certain to be used for the purpose of pushing German trade with Turkey, we in this country should lose no time in looking after our interests in that market.

Business Methods.

Hirsch & Co., retail Hardware merchants, at 327 South Clark street, Chicago, have introduced a novel feature in connection with their business. They have established a free carpenters' employment bureau, and will keep a list of carpenters desiring work, for the convenience of builders and contractors. The scheme has been tried for a sufficient time to prove its desirability. The carpenters who procure work through the friendly offices of the firm are not likely to forget the favor when they are in need of tools. A further stroke of enterprise is the publication of a monthly paper for free distribution called *The Carpenters' Journal*. It is devoted to illustrations and descriptions of new and popular tools. Price lists accompany the descriptions. Hirsch & Co. are live Hardware merchants and have original ideas about the arrangement of their hardware store which will be described in these columns in a future issue.

The McFadden Company, 1025 Market street, Philadelphia, Pa., use a form which is not generally adopted in making quotations from their catalogue. It is of a size somewhat smaller than the pages of their catalogue, so that their patrons may paste it inside their book if they so desire. Under the heading of the firm name, address, &c., and the address of their correspondent, the form is in this wise:

We will be pleased to receive your orders at the following discounts from standard lists, as given in our catalogue. Prices subject to market changes without notice. Terms....

The blank which follows has one column for the catalogue page, a wide space for the description of the goods, and another column for the discount.

Randolph & Clowes, Waterbury, Conn., have adopted a novel method of calling attention to their Seamless Drawn Brass and Copper Tubing. It has the appearance of a legal document, the form being boldly printed in type and the blanks filled in in *fac-simile* of handwriting. The substance of the document is as follows, the filling of the blanks being indicated by italics:

UNITED STATES OF AMERICA.

To all to whom these presents shall come, Greeting:

Know ye that Randolph & Clowes, of the City of Waterbury, County of New Haven, State of Connecticut, have supplied for the use of the United States Government sundry and divers Seamless Drawn Tubes of Brass and Copper, and have delivered the same with commendable and extraordinary promptness, and of a quality equal to, if not superior to, any heretofore received by the Departments.

And, further, the said Randolph & Clowes have entered into a contract with *The Calumet and Hecla Copper Mining Company*, of Lake Superior, State of Michigan, for a full supply of pure Copper, &c., which well-approved brand only will hereafter be used by said Randolph & Clowes to the exclusion of all and every kind and sort whatsoever.

Wherefore, full confidence and reliance may hereafter be placed on the perfection of workmanship and excellent quality of material in all goods, wares and merchandise supplied by

Randolph & Clowes to all citizens and customers whosoever they may befound.

Now therefore, it is strongly urged and recommended that all good citizens of the United States wanting Seamless Drawn Brass and Copper Tubing do order the same forthwith from the said Randolph & Clowes, of the City of Waterbury, County of New Haven, in the State of Connecticut, in the United States of America.

By order of

T. U. BING,
Officer in Charge.

W. H. H. Bonebrake, who is now with Gittings & Porter, Little Rock, Ark., writes us with reference to the convenience of the remittance form of the Towers Hardware Company, Birmingham, Ala., of which we gave a description in a recent issue. Its convenience in checking up is especially referred to.

Prices in England.

A recent issue of the *Iron and Coal Trade Review*, London, contains some prices of Hardware and heavy Iron goods produced in Birmingham and the Midlands district, from which we make some extracts, which will be of interest to some of our readers not familiar with the trade in England, as showing not only the prices ruling, but more especially as illustrating some differences in the way in which goods are designated, listed, &c.:

ANVILS.—Common, 15/3 per cwt.; Best Anvils, not warranted, 18/9 per cwt.; Best Warranted Anvils (bicks tied in 1 to 5 cwt.), 19/9 per cwt.

AXES.—Ship Carpenters', 0/3 to 0/7 per pound; Kent and House Carpenters' ditto, 0/4 to 0/8; ditto, Steel Polished, 0/4½ to 0/8½; Felling Axes, 0/4 to 0/6½; Bright and Blued, Solid Steel, 0/6½ to 0/7½; American Felling or Wedge Axes, Steel Polished, 0/5 to 0/9½ per pound.

AXLE PULLEYS.—Iron, 7/9 to 26/, 1½-inch; Brass Face ditto, 22/6 to 46/, 1½-inch.

BOLTS AND NUTS.—Black, ½ and 5-16 to 2-inch and under, 2/9 and 3/3; ¾-inch, 4/5; 7-16-inch, 5/8 per gross. ½ and 9-16-inch, 19/; ¾ and 11-16-inch, 16/; ¾ to 1½-inch, 15/ per cwt. 2½ to 3½-inch, 3/3; 1-16-inch, 5/; ¾-inch, 5/9; 7-16-inch, 7/1 per gross. ¾ and 9-16 inch, 17/; ¾ and 11-16 inch, 15/; ¾ to 1½ inch, 14/3 per cwt. Square Heads, Round Necks, Square Nuts, 2½ and 3-inch x ¼, 4/; 5-16-inch, 4/7; ¾-inch, 6/; 7-16-inch, 7/4 per gross. ½-inch, 20/; ¾-inch, 17/6; ¾-inch, 16/6 per cwt.

CHAIN.—Machine-made, Wire, single link, "Iron," 65 p. c.; double link ditto, 62½ p. c.; Machine made Wire Chain, single link, "brass," 55 p. c.; registered ditto, 50 p. c.; close link brass Chain, 52½ p. c.; oval link brass Chain, 55 p. c.; brass clock Chain, 52½ p. c.; short link tested (rigging) Chain, 8-16-inch, 16/3; ¾, 13/9; 5-16, 12/; ¾, 11/6; 7-16, 10/9; ¾, 10/3; ¾, 9/9; ¾, 9/6; 1-inch, 9/3 per cwt.; Well Chain, twisted or straight link, ½-inch, 20/6; 3-16, 16/6; ¾, 14/6; 5-16, 12/ per cwt, delivered; japanned Pillar Chains, 1 yard, 16 x 6, 5/9 to 6/9 per dozen; japanned Manger Chains, 1½ yard, 18 x 6, 6/9 to 8/; japanned Rack, 1 yard, 18 x 6, 5/6 to 6/3; japanned Dog, 1½ yard, 12 x 7, 5/9 to 6/9; 2 yards, 14 x 6, 10/9 to 11/9; Cowties, 6/9 to 8/9; open ring, 6/9 to 8/9; close ring, 5/9 to 6/9 per dozen; japanned Watering Chains, 14 x 6, 4/3 to 5/3; tinned ditto, 4/9 to 5/9; Bullock Chains, ¾-inch hook at each end, 13/6 to 14/3.

HORSESHOES.—Fullered fore, 14/6 to 16/6; fullered hind, 16/6 to 18/6; stamped fore, 15/ to 17/; hind, 16/ to 18/.

NAILS.—Patent forged nails, iron or steel, strong rose (flat points), 1-inch, 4 lb., 46/8, &c.; fine rose (flat points), 1-inch, 2½ lb., 73/; 1½-inch, 3½ lb., 58/6; 1½-inch, 4 lb., 55/; 1½-inch, 5 lb., 48/6; 2-inch, 7 lb., 43/6; 2½-inch, 8 lb., 41/6; 2½-inch, 10 lb., 34/6; 2½-inch, 14 lb., 34/; 3-inch, 17 lb., 32/ per cwt.; coopers' rose (sharp points), 2½-inch, 7 lb., per cwt., 2-ton lots, 37/6; 1½-inch, 8 lb., 36/3; 2-inch, 10 lb., 33/9; 2½-inch, 12 lb., 32/; 2½-inch, 17 lb., 29/6; 2½-inch, 10 lb., 28/6; 3-inch, 23 lb., 29/ per m.; fine clasp (sharp points), 1½-inch, 4 lb., 58/4; 1½-inch, 5 lb., 52/3; 2-inch, 7 lb., 45/6; 3½-inch, 8 lb., 42/9; 2½-inch, 10 lb., 38/9; 3-inch, 14 lb., 35/ per cwt.; best Canada (sharp pointed), 1½-inch, 4 lb., per m., 56/; 2-inch, 7 lb., 44/ 2½-inch, 8 lb., 42/9; 2½-inch, 12½ lb., 36/3; 3-inch, 14 lb., 35/ per cwt.; Pound Nails, 6 dy, 2½-inch, 28/6; 8 dy, 2½-inch, 27/; 10 dy, 3½-inch, 23/6; 20 dy, 4-inch, 23/ per cwt.; discounts, 57½ p. c. off Iron, 62½ p. c. off Steel; Nails, Cast Lath, 10/ per cwt.; Wall Nails, Cast, 9/6 per cwt.; Wrought, Best Counter-sunk, Clout and Cone Head Nails, 1-inch, 27/9;

1½-inch, 23/; 2-inch, 21; 2½-inch, 17/6 per cwt. Best Fine Swedish Iron, Countersunk Horse Nails, Stamped, 6 lb, per m., 46/ per cwt.; 8 lb., per m., 43/; 10 lb, per m., 40/ per cwt.: 12 lb., per m., 38/6 per cwt., or subject to 55 p.c. Derby list; Wrought Rose and Deck Head Spikes, 4-inch, 11/9; 5-inch, 10/3; 6-inch, 9/6; 7-inch, 9/3 per cwt.; Galvanized, 5/6 per cwt. extra; Wrought Rose Nails, flat or sharp points, 2-inch, 18/3; 2½, 17/3; 3, 16; 3½, 14/6 per cwt. Wrought Nails, May, 1886, list, 42½ p.c.; Composition Sheathing and Slatting Nails, ½-inch, 0/8½ per lb.; Copper Slatting Nails, cut, 1 to 1½ inch and upwards, 0/11½ to 1/ per lb.

PICKS.—Iron and Steel Excavators, 0/2½ to 0/3½ per lb.

SHOVELS.—Common Iron, round back dust, 4-inch to 8-inch, 1/9 to 6/ per doz., less 25 p.c.; socket handles, 1/ per doz. extra; Ball mouth Shovels, 7-inch to 10-inch, 2/ to 4/ per doz., net; ditto japed, with wood handles, 3/4 to 5/6 per doz., net; Shovels, all Steel, crutch handles, No. 2, 14/; No. 3, 15/; No. 4, 16/ per doz.; No. 5, 17/ per doz.; eye handles, 1/ per doz. extra; riveted ditto, 2/ per doz. extra; Spades and Shovels, common, 60 p.c.; second, 55 p.c.; best, 50 p.c. to 40 p.c. discount off the list.

STEVES.—Brass and Iron, 50 p.c. off list.

STEEL TOYS.—25 to 45 p.c. off the list.

TACKS.—Fine cut, in 1 and 7 lb. parcels, ½-inch, 30/; ¾-inch, 22/; 1-inch, 17/; 1½-inch, 16/; 2-inch, 15/; 3-inch, 14/; 4-inch, 13/ per cwt.; tinned, 7/ per cwt. extra; in ½-cwt. bags, 1/ per cwt. less.

VISES.—Best warranted "black" staple, solid box, 22/6 per cwt.; best warranted "bright" staple, solid box Vises, 26/ to 27/ per cwt.; Vise Boxes and Pins, 55/ per cwt.

WASHERS.—Light Iron, 7½ p.c.; heavy Washers, 13 to 6 W. G., 11/3 per cwt.

WIRE.—Best best Iron or Steel, bright, No. 0 to 6, 7/8; 7, 7/6; 8, 7/9; 9, 8/; 10, 8/3; 11, 8/9; 12, 9/; 13, 9/6; 14, 10/; 15, 10/6; 16, 11/; 17, 11/6; 18, 12/6; 19, 13/6 per cwt. Galvanized, No. 0 to 6, 3/6 per cwt. extra. Best annealed drawn Fence Wire, oiled, No. 0 to 6, 4/7; 7, 4/7; 8, 4/7; 10/9; 9, 4/7; 15/ per ton. Galvanized, No. 0 to 6, 10/10; 7, 10/15; 8, 11/15; 9, 11/15; 15/ per ton. Steel Fence Wire, round or oval, 5/ per ton extra. Black Rolled Fence Wire, 4 or 5, 16. 5/ per ton. Tinned Bottling Wire, No. 22, 30/; 23, 31/3; 24, 33/9 per cwt., cut in lengths and made up in 7-lb. parcels. Fine Galvanized Iron Wire, No. 23, 32/6 per cwt.; Cast Steel Wire, 0/4 to 0/8½ per lb.; Charcoal Iron Wire, 3/6 per cwt. extra; tinned ditto, 8/6 per cwt. extra, delivered in London; 7/6 per ton extra in Liverpool.

Exports.

PER BARK JOHN BAILEY, JANUARY 10, 1889, FOR BRISBANE, AUSTRALIA.

By R. W. Forbes & Son.—6 dozen Pick Handles, 1 case Hardware, 10 dozen Hatchets, 22 sets Axes, 6 sets Wheels, 26 dozen Axe Handles, 10 dozen Picks, 5 boxes Picks, 12 packages Corn Shellers, 30 dozen Shovel Handles, 2 cases Hardware, 22 dozen Pick Handles, 2 dozen Mallets, 12 packages Stoves, 8 dozen Axes, ½ gross Axle Grease, 82 dozen Axe Handles, 10 dozen Hatchets, 8 packages Hardware, 18 dozen Handles, 1 dozen Meat Cutters, 19 dozen Hatchets, 54 dozen Handles, 4 packages Hardware, 1 tierce Hardware, 2 dozen Snaths, 4 dozen Mattocks, 73 packages Stoves, 16 packages Stoves, 20 dozen Axe Handles, ½ dozen Meat Cutters, 1½ dozen Cutters, 27 boxes Belt Studs, 12 packages Stoves, 60 dozen Axes, 1014 dozen Handles, 45 dozen Shovel Handles, 30 packages Stoves, 1000 Broom Handles, 12 packages Corn Shellers, 9 dozen Forks, 30 dozen Axes, 20 gross Shade Rollers, 20 dozen Axes, 1½ gross Axle Grease, 15 packages Hardware, 7 cases Hardware, 1 case Dashers, 7 crates Corn Shellers, 1 case Pencils, 1 case Hardware, 300 Carriage Bolts, 9 crates Stoves, 12 boxes Axes, 12 dozen Picks.

By A. S. Lascelles & Co.—39 packages Lampware, 1 case Wicks.

By F. B. Wheeler & Co.—13 cases Clocks, 40 dozen Brushes, 4½ dozen Brushes, 36 Clocks. By Winchester Repeating Arms Company.—24 Guns, 3000 Cartridges.

By New Haven Clock Company.—26 cases Clocks.

By Ansonia Clock Company.—150 Clocks, 2.3 Clocks.

By Crane & McMahon.—5 cases Carriage-Ware.

By G. P. Patterson.—2217 pounds Cordage.

By H. W. Peabody & Co.—35 packages Carriage-Ware, 1768 pounds Nails, 5550 pounds Bolts, 18 cases Hardware, 6 cases Mattocks, 32 packages Agricultural Implements, 5 crates Emery Wheels, 7 crates Agricultural Implements, 316 dozen Handles, 1 case Edge Tools, 9 cases Carriage-Ware, 1 case Wheelbarrows, 50 cases Edge Tools, 66 packages Hardware, 3 dozen Blacking, 6 packages Lampware, 1050 feet Hose, 119 packages Hardware 89 packages Lampware, 5 pack-

ages Lawn Mowers, 81 sets Axes, 13 crates Agricultural Implements, 4 cases Iron Mills, 4 cases Castings, 2 cases Tacks, 31 cases Hardware, 5 cases Pumps, 1 case Lampware, 4 cases Fire Arms, 12 packages Machinery, 3 packages Blacking, 1 case Hardware, 14 packages Shellers, 2 packages Ironware, 5 cases Toys, &c.

FOR HOBART.

By W. H. Crossman & Bro.—6 dozen Axes, 12 dozen Hatchets, 6 dozen Mattocks, 337 Clocks, 5 cases Tools, 5 dozen Churns, ½ dozen Coffee Mills, 11-12 dozen Meat Choppers, ½ dozen Sausage Stuffers, 3 cases Hardware, 4 dozen Bench Screws, 5 cases Hardware, 1 case Skates, 60 gross Wicks, 30 gross Shade Rollers, 24 boxes Clothes Pins, 1 dozen Store Trucks, 2 dozen Miter Boxes, 1 dozen Mangles, 1 dozen Wringers, 18 dozen Rat Traps, 2 cases Hardware, 1 gross Mop Handles, 6 dozen Pruning Shears, 56 dozen Axes, 12 dozen Hatchets, 6 dozen Mattocks, 36 dozen Axes, 18 gross pounds Blacking, 200 Oil Stoves, 2 dozen Meat Cutters, 12 cases Jacks.

By R. W. Forbes & Son.—1 packages Lampware, 1 package Wringers and Parts, 1 box Boring Machine, 1 package Blocks, 1 package Hardware, 3 packages Feed Cutters, 9 Velocipedes, ½ dozen Carpet Pullers, 2 cases Toys, 80 kegs Cut Nails, 12,960 pieces Roofing Slate, 26,070 pieces Roofing Slate, 150 dozen Axe Handles, 15 dozen Axes.

By F. H. Odiome.—14 cases Brooms.

By Arkell & Douglas.—10 dozen Axes, 5 dozen Blacking, 68 dozen Axes, 1 dozen Wringers, 12 dozen Falls, 2 cases Barrows.

By D. C. Pratt.—408 dozen School Slates.

PER BARK MABEL, JAN. 15, 1889, FOR DUNEDIN, NEW ZEALAND.

By Edward Miller & Co.—9 packages Lamp Goods.

By Ansonia Clock Co.—15 boxes Clocks.

By W. K. Freeman.—41 gross Hardware, 8,400 lbs. Grease, 950 lbs. Wringers, 6050 lbs. Horse Nails, 70 Scales.

By A. S. Lascelles & Co.—1 case Barometers, 1 case Razor Strope, 4 packages Lampware, 4 dozen Cradles.

By R. W. Forbes & Son.—25 dozen Axes, 150 dozen Axe Handles, 52 dozen Brooms, 100 boxes Clothes Pins, 64 dozen School Slates.

By Arkell & Douglas.—6 dozen Wrenches, 280 lbs. Nails, 1½ dozen Braces, 6 dozen Handles, 4 dozen Cotton Hooks, 12 dozen Handles, 1 gross Handles.

By Mailler & Quereau.—200 cases Clothes Pins, 125 dozen Brooms, 36 cases Sewing Machines, 1 case Harrows, 1 case Castings.

By W. H. Crossman & Bro.—34 packages Lamp Goods, 24 gross Wicks, 6 dozen Traps, 1 case Hardware, 2 bundles Washboards, 75 dozen Brooms, 1 case Tools, 950 lbs. Nails, 1 dozen Traps, 12 cases Hardware, 4 cases Tools.

By R. W. Forbes & Son.—12 dozen Sad Irons, 6 dozen Washboards, 12 dozen Oilers, 1 case Toy Banks, 1 case Stamped-Ware, 12 packages Stoves, 25 pounds Staples, 16 packages Washboards, 2 Mangles, 1 dozen Lemon Squeezers, 5 dozen Hatchets, 5 dozen Axes, 12 dozen Spades, 5 dozen Axes, 6 dozen Axe Handles, 5 packages Hardware, 59 pounds Sand Paper.

By R. W. Cameron & Co.—1 Churn, 1 Butter Worker, 20 Dairy Machines, 77 dozen Handles, 7 dozen Hammers, 2 dozen Braces, 100 dozen Hardware, ½ dozen Store Trucks, ¾ dozen Churns, 1 dozen Sad Irons, 40 pounds Sash Cord, 1 dozen Hoes, 8 dozen Axes, Hatchets, &c., 6 dozen Hardware, 5 dozen Saws, 100 pounds Oil Stoves, 3 reams Sand Paper, 350 pounds Nails.

By Strong & Trowbridge.—1 case Wringers, 1 case Tools, 1 case Hardware, 2 cases Hatchets, 1 package Traps, 1 case Traps, 1 case Wringers, 1 package Tools, 1 case Saws, 1 case Hay Knives, 1 case Tools, 2 barrels Lampware, 1 Package Tinware, 6 cases Axes, 36 dozen Axe Handles, 2 cases Rake Handles, 2 cases Shade Rollers, 1 case Hammers, 3 cases Choppers, 2 cases Pumps, 2 cases Wringers, 3 crates Churns, 3 boxes Hardware, 1 crate Churns, 6 cases Matches, 1 case Carpet Sweepers, 1 case Bludge Forks, 20 dozen Small Brooms, 1 case Forks, 2 cases Wringers, 1 case Clocks, 8 cases Axes, 2 cases Rivets, 12 cases Tools, 1 crate Falls, 21 crates Stoves and Ranges, 1 bale Rubber Springs, 1 case and 2 cases Pumps, 10 cases Axes, 1 barrel Blocks, 2 cases Wood Working Machinery, 57 packages Falls, Tubs, &c., 1 case Spirit Levels, 2 crates Stoves, 1 case Clocks, 1 case Hardware, 1 case Tools, 7 cases Hardware, 11 bundles Oars, 6 crates Trucks and Parts, 7 cases Hardware, 4 cases Wringers, 7 cases Clothes Pins.

By H. W. Peabody & Co.—39 packages Hardware, 4 packages Agricultural Implements, 24 dozen Shade Rollers, 3 cases Lampware, 55 packages Stoves, 8 cases Glue, 12 cases Nails, 380 dozen Handles, 6 sets Axes, 125

gross Fire Arms, 26 gross Blacking, 1 case Eyelets, 1 bundle Hardware, 300 pounds Twine, 10 packages Hardware, 2 packages Lampware, 700 Bolts and Nuts, 24 packages Stoves, 1 case Mills, 11,200 pounds Barb Wire, 40 dozen Handles, 1 case Carriage-Ware, 2 cases Agricultural Implements, 3 crates Churns, 3 cases Hardware, 36 Car-Wheels, 1 bale Hose, 2 barrels Lampware, 2 cases Wringers, 1 case Hardware, 1 case Axle Arms, 2 dozen Wringers, 1 case Fan Mills, 2 cases Agricultural Implements, 4 dozen Wringers.

By Chas. Brewer & Co.—5 cases Handles, 22-400 pounds Wire, 2 cases Tools, 8 cases Nails, 1 case Hardware, 2 cases Trucks, 12 cases Handles, 1 case Hardware, 1 case Carriage Woodware, 16 cases Tools, 8 crates Stoves, 4 cases Hardware, 1 bale Rubber, 3 cases Agricultural Implements, 14 packages Creamery Goods, 6 packages Creamery Goods, 57 cases Handles, 6 cases 3 bundles Carriage Woodware, 46 cases 1 barrel Tools, 31 crates Stoves, 8 packages Hollow-Ware, 16 cases Hardware, 35 cases Nails, 1 bale Rubber, 2 cases Flint Paper, 1 case Blacking, 6 crates Falls, 9 cases Handles, 2 cases Brooms, 3 cases Tools, 21 bundles Carriage Woodware.

PER BRIG STELLA, JANUARY 17, 1889, FOR LITTLETON, NEW ZEALAND.

By D. C. Pratt.—440 dozen School Slates.

By A. S. Lascelles & Co.—4 packages Lampware.

By A. Field & Co.—593 pounds Hardware, 10 dozen Wood Handles, 32 dozen Handles, 3 Drills.

By Edward Miller & Co.—28 packages Lamp Goods, 21 packages Lamp Goods, 15 packages Lamp Goods, 9 packages Lamp Goods.

By F. B. Wheeler & Co.—24 dozen Axe Handles.

By Coombs, Crosby & Eddy.—25 dozen Lamp Goods.

By Hoadley & Co.—10 cases Hardware, 18 Churns.

By W. H. Crossman & Bro.—1 case Hardware.

By R. W. Forbes & Co.—40 dozen Whip Handles, 1 case Saddlery, 712 pounds Carriage Bolts, 2 packages Carriage Woodwork, 3 packages Hardware, 10 packages Lawn Mowers, 26 packages Lawn Mowers, 1 dozen Wringers, 30 dozen Axe Handles, 24 dozen Axes, 1 dozen Drills.

By Arkell & Douglas.—6 dozen Axes, 12½ dozen Axes, 4 dozen Braces, 9 dozen Wrenches, 2 dozen Saws, 1 dozen Scales, 110 pounds Cordage, 10 gross Shade Rollers, 4 dozen Hatchets, 6 dozen Hammers, ½ dozen Wringers, 46 dozen Handles, 2 dozen Latches, 1½ dozen Churns, 1 dozen Trucks.

By Mailler & Quereau.—36 dozen Handles, 6 dozen Snaths, 1 case Shade Rollers, 1 case Oil Stones, 1 case Wire Goods, 1 case Egg Beaters, 12 sets Axes, 1 case Oilers, 3 cases Hardware, 6 cases Wringers, 1 case Traps, 1 case Printing Presses, 120 dozen Brooms, 100 cases Clothes Pins.

By H. W. Peabody & Co.—1 ton Wire, 1 case Tools, 12 cases Wringers, 15 cases Tools, 80 dozen Handles, 7 packages Lampware, 25 dozen Brooms, 4480 pounds Horse Nails, ½ gross Blacking, 108 dozen Tools, 9 cases Handles, 30 packages Sewing Machines, 12 packages Hardware, 8 packages Lampware, 8 packages Machinery, 9520 pounds Nails, 30 cases Blacking, 1 package Razors, 12 packages Hardware, 50 dozen Brooms, 5 cases Handles.

PER BARK OKONOM, JANUARY 23, 1889, FOR PORT NATAL, SOUTH AFRICA.

By Coombs, Crosby & Eddy.—6 Pumps, 12 dozen Handles, 34 dozen Picks, 6 dozen Agricultural Implements, 4 dozen Tools, 11 dozen Picks, 2½ dozen Step Ladders, 1 gross Brooms, 48 Plows, 20 Agricultural Implements, 4 dozen Picks, 4 dozen Forks, 2½ dozen Step Ladders, 1 dozen Bench Screws, 12 Wringers, &c., 1 dozen Churns, 6 dozen Sewing Machines, 40 Plows, 4 dozen Picks, 32 dozen Handles, 1 case Slates, 25 dozen Brooms, 12 Washers, 1 case Tools, 2 Scales, 2 dozen Axes, 120 Plow Parts, 25 dozen Brooms, 24 dozen Handles, 6 dozen Spades, 48 Plows and Parts, 12 Wringers, &c., 6 Store Trucks, 1 case Plow Handles, 6 Corn Shellers, 120 dozen Handles, 12 gross Stove Blacking, 6 dozen Washboards, 10 boxes Clothes Pins, 12 Washing Machines, 6 Corn Shellers, 25 packages Carriage-Ware, 66 Plows, 378 pieces Agricultural Implements, 12 Corn Shellers, 6 Hand Carts, 2 dozen Meat Cutters, 1 dozen Churns, 250 Handles, 10 boxes Clothes Pins, 28 Washing Machines, 2½ dozen Tools, 6 Mangles, 28 dozen Edge Tools, 18 Ladders, 3 Pumps, 5 cases Hardware, 6 Saws, 5 Pumps, 20 crates Axes.

By Woodhouse & Stortz.—60 barrels Hardware.

By M. Berliner.—30 Carts.

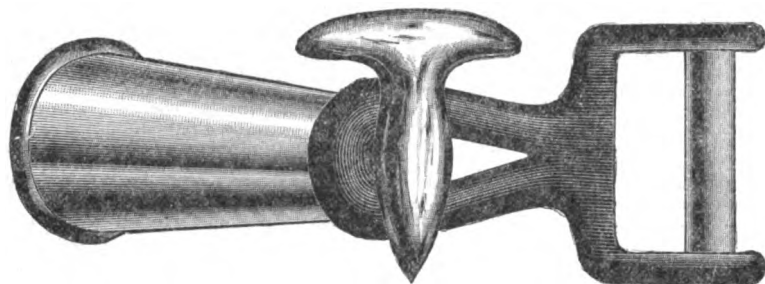
By W. H. Crossman & Bro.—26 packages Stoves, 36 cases Plow Parts.

The Burgett Safety Whiffletree Hook.

The illustration given herewith represents a new whiffletree hook, now being offered to the trade by Michael Greenbaum's Sons, 9 and 11 North Canal street, Chicago, who have secured the exclusive sales agency. In the illustration the trace-

lines leading to the West was held at the Monongahela House, Pittsburgh, on Friday, the 25th inst. The object of the meeting was to discuss freight rates, the companies having advanced rates on January 1 from 10 to 25 per cent. Considerable dissatisfaction was expressed by the pig iron manufacturers at the advance, and it was decided to ask the railroad repre-

sentatives to meet them and hear their arguments on the subject, which they claimed would show that the advance was unwarranted. After hearing the arguments made by the pig iron manufacturers it was decided to bring the matter before the meeting of the presidents of the trunk lines to be held in Pittsburgh on the 31st inst. It is the general impression that a reduction in the rates will be made.



The Burgett Safety Whiffletree Hook.

loop, or cock-eye, is shown in position on the whiffletree, with the hook standing vertically, thus, as will be seen, effectually preventing the trace getting free from it accidentally. The hook is made of one piece of metal with the socket by which it is secured to the whiffletree. It is of great strength, has no springs or other devices to get out of order, but is simple of construction and thoroughly durable. These hooks are offered by the sales agents at a very low price. The device was patented December 20, 1887.

The Perfection Key Holder.

This article is manufactured by the Ames Sword Company, Chicopee, Mass. It consists of a spring padlock $\frac{1}{4}$ inch in



The Perfection Key Holder.

diameter, with a small chain attached to the eye in the shackle. The keys are to be strung on a chain, the end of which is passed over the shackle and the latter closed. It can readily be opened with a common pin. The whole is handsomely nicked, and is tasteful, useful and durable. The advantage of a chain instead of a ring for holding keys is especially alluded to as conducing much to the ease and comfort of carrying them.

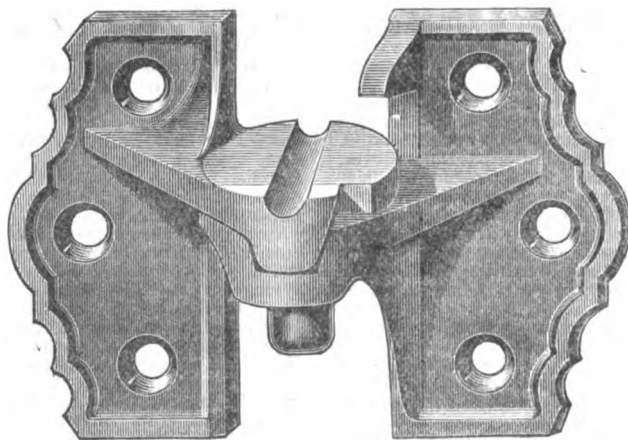
The new freight tariff on iron and steel between Chicago, Peoria and Mississippi River points on the Rock Island railroad and St. Paul and Minneapolis is as follows: Railway supplies, $11\frac{1}{4}$ cents; iron or steel rails, \$2.25 per ton; street railway yokes, &c., 15 cents; pig iron, per ton, \$2.50; bar iron and similar commodities, nails, &c., 15 cents; cast-iron pipe, 15 cents; wrought iron-pipe, $17\frac{1}{4}$ cents. The rate given is per 100 pounds, except in the cases noted, and is for straight carloads.

A meeting of the pig iron manufacturers of the Mahoning and Shenango valleys and the managers of the various railroad

lines leading to the West was held at the Monongahela House, Pittsburgh, on Friday, the 25th inst. The object of the meeting was to discuss freight rates, the companies having advanced rates on January 1 from 10 to 25 per cent. Considerable dissatisfaction was expressed by the pig iron manufacturers at the advance, and it was decided to ask the railroad repre-

New Gravity Push and Pull Hinge.

This article is put on the market by William P. Kellogg, Troy, N. Y., for whom Fuller Bros., 33 Chambers street, New York, are agents. It is represented in the accompanying illustration, from which it will be seen that it embodies new features. The points claimed for it are: That it is operated by pushing and pulling, and not lifting a dead weight, as in other hinges; that there is no danger of lifting the blind off the pintles and dropping it, as sometimes occurs with those in use; that it locks the blinds open, and also locks them when closed, and that for this reason no inside fasteners are required; and that they are provided with a back stop that positively prevents rattling of the blinds. Having these features, the point is also made that in their use there is a saving of fully one-fourth of the labor



New Gravity Push and Pull Hinge.

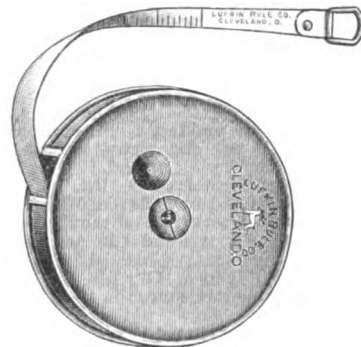
and one-fifth of the screws required in putting up blinds with the ordinary hinges. The manufacturer also calls attention to the fact that there is no loss of security in dispensing with inside fastenings, such as are used with other hinges, inasmuch as the function of such fasteners is to keep the blind in place when closed, they not being a protection against burglars, as they are easily opened by inserting the

will carry 300 saloon, 150 cabin and 750 steerage passengers. Electric lights illuminate every part of the ship, and instead of four masts with square yards she has three pole masts.

A stock company is being formed at Decatur, Ill., to bore for natural gas at that place, a former attempt having been unsuccessful.

Steel Pocket Tape.

This article, which is represented in the accompanying illustration, is put on the market by the Lufkin Rule Company, Cleveland, Ohio. It is a steel tape made in 3, 4, 5 and 6 foot lengths, self-winding and operated by the slide shown, the case being nickel plated. This is the most re-



Steel Pocket Tape.

cent addition by the company to their line of steel measures.

Dr. Gatling, of Hartford, has invented a torpedo boat which he thinks has solved the problem of harbor defence. Four of them can be built for \$100,000. Its action is controlled wholly by the intelligence of operators in it, and the boat moves at extremely high speed. Until patents are secured Dr. Gatling gives no further information.

The new White Star steel steamship Teutonic has been successfully launched from the yard of Harland & Wolff, her builders, at Belfast, Ireland. She is the longest ship afloat, measuring 582 feet. Her beam is 57 feet 6 inches, her depth 39 feet 4 inches, her gross tonnage 10,000. Triple expansion engines will drive her twin propellers with manganese bronze blades, and she is so fitted that 12 guns can be mounted on her in 48 hours. She

CURRENT HARDWARE PRICES.

JANUARY 30, 1889.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers' name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers, at the figures named.

Ammunition.—

Caps, Percussion, \$1000—	
Hicks & Goldman's	
F. L. Waterproof, 1-10's.....	50¢
E. B. Trimmied Edge, 1-10's.....	65¢
E. B. Grad. Edge, Cent. Fire, 25 & 1-10's.....	70¢
Double Waterproof, 1-10's.....	50¢
Musket Waterproof, 1-10's.....	50¢
G. D. S. B.....	30¢

Union Metallic Cartridge Co.	
F. C. Trimmied.....	50¢
F. L. Ground.....	65¢
Cent. Fire Ground.....	70¢
Dbl. Waterproof.....	75¢
Dbl. Waterproof, in 1-10's.....	80¢
S. B. Genuine Imp.orted.....	45¢
Eley's B. B.....	50¢
Eley's D Waterproof, Central Fire.....	1.00

Cartridges.	
Rim Fire Cartridges.....	50¢ & 52¢
Rim Fire Military.....	15¢ & 2¢
Cent. Fire, Pistol and Rifle.....	25¢ & 52¢
Cent. Fire, Military and Sporting.....	15¢ & 52¢
Blank Cartridges, except 22 and 32 cal., additional 10% on above discount.....	
Blank Cartridges, 22 cal.....	1.75, dis 2¢
Blank Cartridges, 32 cal.....	3.50, dis 2¢
Primed Shells and Bullets.....	15¢ & 52¢
B. B. Caps, Round Ball.....	1.75, dis 2¢
B. B. Caps, Con. Ball, Swgd.....	32.00, dis 2¢
Primers.	
Berdan Primers.....	1.00, dis 2¢
B. L. Caps (for Sturtevant Shells) 1.00, dis 2¢	
All other Primers.....	1.20, dis 2¢

Shells.	
First quality, 4, 8, 10 and 12 gauge.....	25¢ & 10¢
First quality, 14, 16 and 20 gauge (10 list).....	30¢ & 10¢
Star, Club, Rival and Climax brands, 10 and 12 gauge.....	33¢ & 10¢
Club, Rival and Climax brands, 14, 16 and 20 gauge.....	30¢ & 10¢
Seibolt's Comb. Shot Shells.....	15¢ & 52¢
Brass Shot Shells, 1st quality.....	60¢ & 52¢
Brass Shot Shells, Club, Rival, Climax.....	65¢ & 52¢
I X L, 10 and 12 gauge.....	40¢ & 52¢
"Special," 16 gauge.....	30¢ & 10¢
"Special," 10 and 12 gauge.....	40¢ & 10¢
Fowler's Pat.....	3.25

Shells Loaded—	
A. M. Co. List No. 19, 1887.....	20¢ & 10¢
Wads—	
U. M. C. & W. R. A.—B. E., 11 up.....	2.00
U. M. C. & W. R. A.—B. E., 9 & 10.....	2.30
U. M. C. & W. R. A.—B. E., 7 & 8.....	2.60
U. M. C. & W. R. A.—P. E., 11 up.....	3.10
U. M. C. & W. R. A.—P. E., 9 & 10.....	3.40
U. M. C. & W. R. A.—P. E., 7 & 8.....	4.90
Eley's B. E., 11 up.....	1.75
Eley's P. E., 11 up.....	2.80

Anvils.	
Eagle Anvils.....	10¢, dis 20¢ & 20¢
Peter Wright's.....	84¢
Armstrong's Mouse Hole.....	84¢
Armstrong's Mouse Hole, Extra 11 1/4.....	1.14
Trenton.....	7.00
Wilkinson's.....	1.10
J. & Riley Carr, Pat. Solid.....	1.10
Moore & Barnes Mfg. Co.....	33¢

Anvil Vise and Drill—	
Millers Falls Co.....	118.00, dis 20¢
Cheney Anvil and Vise.....	25¢
Allen Combined Anvil and Vise.....	43.00, dis 10¢

Apple Parers—

Advance.....	10¢ doz \$4.75
Antrim Combination.....	10¢ doz 5.50
Baldwin.....	10¢ doz 5.25
Champion.....	10¢ doz 5.25
Chapman, 1888.....	each 17.00
Family Bay State.....	10¢ doz 12.00
Gem.....	10¢ doz 5.25
Gold Medal.....	10¢ doz 4.00
Hudson's New '88.....	10¢ doz 3.75
Ideal.....	10¢ doz 4.75
Improved Bay State.....	10¢ doz 30.00
Little Star.....	10¢ doz 5.00
Monarch.....	10¢ doz 13.50
New Lightning.....	10¢ doz 5.50
Orion.....	10¢ doz 4.00
Penn.....	10¢ doz 4.00
Perfection.....	10¢ doz 4.00
Pomona.....	10¢ doz 4.00
Rocking Table.....	10¢ doz 4.00
Turntable.....	10¢ doz 4.50
Victor.....	10¢ doz 13.50
Waverly.....	10¢ doz 4.50
White Mountain.....	10¢ doz 4.50
72.....	10¢ doz 4.25
76.....	10¢ doz 5.75
78.....	10¢ doz 6.50

Augers and Bits—

Douglas Mfg. Co.....	
Wm. A. Ives & Co.....	70¢
Humphreysville Mfg. Co.....	
French, Swift & Co. (F. H. Beecher).....	
Cook's, Douglas Mfg. Co.....	55¢
Cook's, N. H. Copper Co. 50¢ & 10¢ & 50¢ & 10¢	
Ives' Circular Lip.....	30¢
Patent Solid Head.....	30¢
C. E. Jennings & Co., No. 10, extension lip.....	40¢
C. E. Jennings & Co., No. 30.....	60¢
C. E. Jennings & Co., Auger Bits, 1/2 set, 3 1/4 quarters, No. 5, 35; No. 30, 65, dis 2¢	
Jennings' Augers and Bits.....	45¢
Imitation Jennings' Bits.....	60¢ & 80¢
Pugh's Black.....	20¢
Car Bits.....	50¢ & 10¢
L'Hommedieu Car Bits.....	15¢ & 10¢
Ortner Pat. Auger Bits.....	10¢

Hollow Augers—

Ives'.....	25¢ & 10¢ & 25¢
French, Swift & Co.....	10¢ & 5¢
Douglas.....	
Bonney's Adjustable, 1/2 doz \$48, dis 40¢ & 10¢	
Stearns' Expansive, each \$4.50, dis 50¢ & 5¢	
Universal Expansive, each \$4.50, dis 20¢	
Wood's.....	25¢ & 25¢ & 10¢

Expansive Bits—

Clarks' small, 1/8; large, 3/16.....	35¢ & 35¢ & 5¢
Ives' No. 4, 1/2 doz \$20.....	25¢ & 25¢ & 5¢
Swan's.....	40¢
Steer's, No. 1, 1/2 doz; No. 2, 1/2 doz.....	35¢ & 35¢
Stearns' No. 2, 1/2 doz.....	20¢

Gimlet Bits—

Common.....	1/2 gross \$2.75 @ \$3.25
Diamond.....	1/2 doz \$1.10; dis 25¢ & 10¢
"Bee".....	25¢ & 25¢ & 5¢
Double Cut, Sheppardson's.....	45¢ & 15¢ & 5¢
Double Cut, Ct. Valley Mfg. Co.....	30¢ & 10¢
Double Cut, Hartwell's, 1/2 gross.....	55¢
Double Cut, Douglas's.....	40¢ & 10¢
Double Cut, Ives.....	60¢ & 60¢ & 5¢

Bit Stock Drills—

Morse Twist Drills.....	50¢ & 10¢ & 5¢
Standard.....	50¢ & 10¢ & 5¢
Cleveland.....	50¢ & 10¢ & 5¢
Syracuse, for metal.....	50¢ & 10¢ & 5¢
Syracuse, for wood (wood list).....	30¢ & 30¢ & 5¢
Williams' or Holt's, for metal.....	50¢ & 10¢ & 10¢
Williams' or Holt's, for wood.....	40¢ & 10¢

Ship Augers and Bits—

L'Hommedieu's.....	15¢ & 10¢ & 15¢ & 10¢ & 5¢
Watrous.....	15¢ & 10¢ & 15¢ & 10¢ & 5¢
Snell's.....	15¢ & 10¢ & 15¢ & 10¢ & 5¢
Snell's Ship Auger Pattern Car Bits.....	15¢ & 10¢ & 15¢ & 10¢ & 5¢

Awl Hafts—

Sewing, Brass Fer. 1/2 gr. \$3.50.....	45¢ & 10¢
Pat. Sewing, Short.....	1.00, dis 40¢ & 10¢
Pat. Sewing, Long.....	1.20, dis 1.20
Pat. Peg, Plain Top.....	1.00, dis 45¢ & 10¢
Pat. Peg, Leather Top.....	1.20, dis 45¢ & 10¢

Awls, Brad Sets, &c.—

Awls, Sewing, Common.....	1/2 gr \$1.70, 35¢
Awls, Should. Peg.....	1/2 gr \$2.45, 40¢ & 40¢ & 10¢
Awls, Pat. Peg.....	1/2 gr 65¢, dis 40¢ & 40¢ & 10¢
Awls, Shouldered Brad.....	2.70, gr. dis 35¢
Awls, Handled Brad.....	7.50, gr. dis 45¢
Awls, Handled Scratch.....	1/2 gr \$7.50, 35¢ & 10¢
Awls, Socket Scratch.....	1/2 gr \$1.50, 25¢ & 30¢

Awl and Tool Sets—

Aiken's Sets, Awls and Tools, No. 20, 1/2 doz \$10.00, dis 55¢ & 10¢	
Fray's Adj. Tool Hds., Nos. 1, 1 1/2; 2, 1 1/2; 3, 1 1/2; 4, 1 1/2; dis 25¢ & 25¢ & 10¢	
Miller's Falls Adj. Tool Hds., No. 1, 1 1/2; 2, 1 1/2; 3, 1 1/2; 4, 1 1/2; dis 25¢	
Henry's Combination Haft.....	1/2 doz \$6.50
Brad Sets, No. 42, 10.50; No. 43, 12.50; dis 70¢ & 10¢ & 5¢	
Brad Sets, Stanley's Excelsior: No. 1, 7.50; No. 2, 4.00; No. 3, 3.50, dis 30¢ & 10¢	

Axes—

Makers' and Special Brands—

First quality.....	1/2 doz \$6.00 @ \$6.50
Others.....	1/2 doz \$5.50 @ \$5.75

Axle Grease—

Fraser's.....	1/2 Keg 1/2 doz \$4.00, 1/2 doz \$4.50
Fraser's, in boxes.....	1/2 gr \$0.50
Dixon's Everlasting, in bxs.....	1/2 doz 1 lb \$1.20; 2 lb \$2.00
Dixon's Everlasting.....	10-lb pails, ea. 85¢
Lower grades, special brands.....	1/2 gr \$5.50 @ \$7.00

Axles—

No. 1.....	4¢ @ 1 1/4¢, No. 2 5 1/4¢ @ 5 1/4¢
Nos. 7 to 18.....	5¢ @ 5¢
Nos. 19 to 22.....	60¢ & 10¢ & 10¢ & 70¢
National Wrought Steel Tubular Self-Oiling.....	Standard Farm (1 to 5) and Special Farm (A1 to A5):
Less than 10 sets.....	3.00
Over 10 sets.....	3.00 @ 3.50

Bag Holders.

Sprengle's Pat.....	1/2 doz \$18, dis 40¢
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Balances—

Spring Balances.....	50¢
Common 24-lb.....	1/2 doz \$1.50, dis 50¢
Chatillon's Spring Balances.....	50¢
Chatillon's Circular Spring Balances.....	60¢

Bells—

Hand—

Light Brass.....	70¢ & 10¢
Extra Heavy.....	60¢ & 10¢
White Metal.....	60¢ & 10¢ & 10¢
Silver Chime.....	35¢ & 10¢
Globe (Cone's Patent).....	25¢ & 10¢ & 5¢

Door—

Gong, Abbe's.....	33¢ & 10¢
Gong, Yankee.....	45¢ & 10¢
Gong, Barton's.....	40¢ & 10¢ & 50¢
Crank, Taylor's.....	25¢ & 10¢
Crank, Brooks.....	50¢ & 10¢ & 2¢
Crank, Cone's.....	10¢

Crank, Connel's.....	20¢ & 10¢
Lever, Sargent's.....	60¢ & 10¢
Lever, Taylor's Bronzed or Plated.....	net
Lever, Taylor's Japanned.....	25¢ & 10¢
Lever, R. E. M. Co.'s.....	50¢ & 10¢ & 2¢
Pull, Brook's.....	50¢ & 10¢ & 2¢
Pull, Western.....	25¢ & 10¢

Coin—

Common Wrought.....	60¢ & 10¢
Western.....	20¢ & 10¢
Western, Sargent's list.....	70¢ & 10¢
Kentucky, "Star".....	20¢ & 10¢
Kentucky, Sargent's list.....	70¢ & 10¢
Dodge, Genuine Kentucky.....	70¢ & 10¢
Texas Star.....	50¢ & 10¢ & 50¢ & 10¢ & 5¢
Call.....	40¢ & 40¢ & 5¢
Farm Bells.....	1/2 doz 3¢ @ 3 1/4¢
Steel Alloy Church and School Bells.....	40¢

Bellows—

Blacksmith's.....	50¢ & 10¢ & 50¢ & 60¢
Molders.....	40¢ & 40¢ & 10¢
Hand Bellows.....	40¢ & 10¢ & 50¢

Belting, Rubber—

Common Standard.....	70¢ & 10¢
Standard.....	70¢ & 10¢
Extra.....	60¢ & 5¢ & 60¢ & 10¢
N. Y. B. & P. Co., Carbon.....	90¢ & 10¢ & 5¢
N. Y. B. & P. Co., Diamond.....	50¢ & 10¢

Bench Stops—

Morrill's.....	1/2 doz \$9, dis 50¢
Hotchkiss's.....	1/2 doz \$5, dis 10¢ & 10¢ & 10¢
Weston's, No. 1, \$10; No. 2, \$9.25 @ \$10.50	
McGill's.....	1/2 doz \$3, dis 10¢

Bits—

Auger, Gimlet, Bit Stock, Drills, &c., see Augers and Bits.	
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Bit Holders—

Extension, Barber's, 1/2 doz \$15.00, dis 40¢ & 40¢ & 10¢	
Extension, Ives, 1/2 doz \$20.00, dis 60¢ & 5¢	
Diagonal.....	1/2 doz \$24.00, dis 40¢
Angular.....	1/2 doz \$24.00, dis 40¢ & 5¢

Blind Adjusters—

Domestic.....	1/2 doz \$3.00, dis 33 1/3¢
Excelsior.....	1/2 doz \$10.00, dis 50¢ & 10¢ & 2¢
Washburn's Self-Locking.....	20¢ & 20¢ & 10¢

Blind Fasteners—

MacKrell's, 1/2 doz, \$1.00, dis 20¢ & 20¢ & 10¢	
Van Sand's Screw Pat., \$15 1/2 gr. 60¢ & 10¢	
Van Sand's Old Pat., \$15.00 1/2 gr. 55¢ & 10¢	
Washburn's Old Pattern.....	80¢, 1/2 gr net
Merriman's.....	new list, net
Austin & Eddy No. 2008.....	80¢, 1/2 gr net
Security Gravity.....	80¢, 1/2 gr net

Blind Staples—

Barbed, 1/4 in. and larger.....	1/2 doz 7 1/2¢ @ 8¢ net
Barbed, 3/4 in.....	1/2 doz 8 1/2¢ @ 9¢ net

Blocks—

Cleveland Block Co., Mal. Iron.....	50¢
Novelty Tackle Blocks, Mal. Iron.....	50¢

Bolts—

Door and Shutter—

Cast Iron Barrel, Square, &c.....	70¢ & 70¢ & 10¢
Cast Iron Shutter Bolts.....	70¢ & 70¢ & 10¢
Cast Iron Chain (Sargent's list).....	65¢ & 10¢
Ives' Patent Door Bolts.....	60¢
Wrought Barrel.....	70¢ & 70¢ & 10¢
Wrought Square.....	70¢ & 70¢ & 10¢
Wrt Shutter, all Iron, Stanley's.....	90¢ & 10¢
Wrt Shutter, Brass Knob.....	40¢ & 10¢
Wrt Shutter, Sargent's list.....	60¢ & 10¢
Wrt Sunk Flush, Sargent's list.....	55¢ & 10¢
Wrt Sunk Flush, Stanley's list.....	50¢ & 10¢
Wrt B.K. Flush, Com'n.....	55¢ & 10¢

Carriage, Machine, &c.—

Com. list June 10, '84.....	75¢ & 2 1/2¢ & 2¢
Genuine Eagle, list Oct 7, '84.....	75¢ & 10¢
Phila. pattern, list Oct 7, '84.....	75¢ & 10¢
R.B. & W., old list.....	70¢
Machine, according to size.....	75¢ & 10¢ & 80¢
Bolt Ends, according to size.....	75¢ & 10¢ & 80¢

Tire—

Common, list Feb. 28, '83.....	70¢
P.C.B. & N. Co., Empire, list Feb 28, '83.....	70¢
P.C.B. & N. Co., Phila., list Oct. '84.....	82 1/2¢

Cards—

Horse & Curry.....10&10@10&10&10%
Cotton.....New List, Aug. 1888.
10&10&10%
Wool.....New List, Aug. 1888.
10&10&10%

Carpet Stretchers—

Cast Steel, Polished.....\$ doz \$2.25
Cast Iron, Steel Points.....\$ doz \$2.80
Socket.....\$ doz \$1.75
Bullard's.....25&25&10%

Carpet Sweepers—

Bissell No. 5.....\$ doz \$17.00
Bissell No. 7 New Drop Pan.....\$ doz \$19.00
Bissell, Grand.....\$ doz \$38.00
Grand Rapids.....\$ doz \$24.00
Crown Jewel, No. 1, \$18.00; No. 2,
\$19.00; No. 3, \$20.00.
Magic.....\$ doz \$15.00
Jewel.....\$ doz \$17.00
Improved Parlor Queen, Nickle-
doz \$27.00
Improved Parlor Queen, Japanned
doz \$24.00
Excelsior.....\$ doz \$22.00
Garland.....\$ doz \$18.00
Parlor Queen.....\$ doz \$24.00
Housewife's Delight.....\$ doz \$15.00
Queen.....\$ doz \$18.00
Queen, with band.....\$ doz \$18.00
King.....\$ doz \$30.00
Weed, Improved.....\$ doz \$18.00
Hub.....\$ doz \$16.00
Cog Wheel.....\$ doz \$22.00
Conqueror.....\$ doz \$22.00
Easy.....\$ doz \$22.00
Monarch.....\$ doz \$22.00
Goshen.....\$ doz \$21.00
Advance.....\$ doz \$18.00
Ladies' Friend, No. 1, \$ doz, \$15.00;
No. 2, \$ doz, \$16.00;
American.....\$ doz \$18.00
Grand Republic.....\$ doz \$35.00

Cartridges—

See Ammunition.

Casters—

Bed.....New List:
Plate.....Brass, 55&55&5%
Shallow Socket.....Others, 60&60&5%
Deep Socket.....40&10%
Yale Casters, 1st May, 1884.....30&10&4%
Yale, Gem.....80&60&5%
Martin's Patent (Phoenix).....45&10&5%
Payson's Anti-friction.....60&60&10%
"Giant" Truck Casters.....10&10&5%
Stationary Truck Casters.....45&10%

Cattle Leaders—

Humason, Beckley & Co.'s.....70%
Sargent's.....60%&10%
Hotchkiss.....30%
Peck, Stow & W. Co.....50&10%

Chain—

Trace, 6 1/2-10-2, exact, \$ pair, \$1.03
50&10&50&10&5%
Trace, 6 1/2-10-3, exact, \$ pair \$2.
50&10&50&10&5%
Trace, 7-10-2, exact, \$ pair \$1.11
50&10&50&10&5%
NOTE.—Traces, "Regular" sizes, 3¢ net
per pair less than exact.
Log, Fifth, Stretcher, and other fancy
Chains, List Nov. 1, 1884
50&10&50&10&5%

American Coll.....3-16 1/2 5-16 3/4
In caak lots.....\$3.75 6.25 5.00 4.50
American Coll.....7-16 1/2 3/4 1/2
In caak lots.....\$4.40 4.00 3.75 3.50
Less than caak lots, add 1/4¢@1/4¢ per lb.

German Coll, list of June 20, 1887.....50&10&50&10&5%
German Halter Chain, list of June 30,
1887.....50&10&50&10&5%
Covert Halter, Hitching and Breast
50&2%
Covert Traces.....30&2%
Onaida Halter Chain.....60&60&5%
Galvanized Pump Chain.....75&75&5%
Jack Chain, Iron.....75&75&5%
Jack Chain, Brass.....70&70&5%

Chalk—

White.....\$ gr 50¢
Red.....\$ gr 70¢
Blue.....\$ gr 85¢
White Crayons.....\$ gr 12¢@12 1/2¢, dis 10%

Chalk Lines—

See Lines.

Chisels—

Socket Framing and Firmer.
P. S. & W.....75&5&75&10%
New Haven and Middle-
sex.....75&5&75&10%
Mix.....75&5&75&10%
Ohio Tool Co.....30%
Buck Bros.....30%
Merrill.....60&10&60&10&5%
L. & J. White.....30&30&5%
Wetherby & Douglass.....75&75&5%
Tanged and Miscellaneous.....40&10%
Tanged Firmers.....\$4.75@5.00
Tanged Firmers, Spear & Jackson's
\$0 to \$
Cold Chisels, \$ doz.....16@19¢

Chucks—

Beach Pat.....each, \$8.00, dis 20%
Morse's Adjustable.....each, \$7.00, dis 20%
Danbury.....each, \$6.00, dis 30@30&5%
Syracuse, Balz Pat.....25%

Clamps—

Providence Tool Co.'s Wrought Iron.....25%
Adjustable, Gray's.....25%
Adjustable, Lambert's.....20%
Adjustable, Snow's.....40&5%
Adjustable, Hammers.....15%
Adjustable, Stearn's.....20&10%
Stearn's Adjustable Cabinet and Cor-
ner.....20&10%
Cabinet, Sargent's.....60&10%
Carriage Makers, Sargent's.....70&10%
Eberhard Mfg. Co.....40&10&40&10%
Warner's.....40&10&40&10&5%
Saw Clamps, see Vises.

Clips—

Norway, Axle, 1/4 & 5-16.....55&5&5%
Second grade Norway Axle, 1/4 & 5-16
65&5%
Superior Axle Clips.....60%&25@60%&5&5%

Norway Spring Bar Clips, 5-16.....60&5&5%
Wrought Iron Felloe Clips.....\$ doz \$1.50
Steel Felloe Clips.....\$ doz \$1.50
Baker Axle Clips.....25%

Cockeyes—

50%

Cocks, Brass—

Hardware list.....40. & 10&2%

Coffee Mills—

Box and Slide, List revised Jan. 1, 1888,
50&2%
American, Enterprise Mfg. Co. 20&10&30%
The "Swift," Lane Bros.....20&10%

Compasses, Dividers, &c—

Compasses, Callipers, Dividers.....70@70&10%
Bemis & Call Co.'s Dividers.....60&5%
Bemis & Call Co.'s Compasses & Call-
ipers.....50&5%
Bemis & Call Co.'s Wing & Inside or
Outside.....50&5%
Bemis & Call Co.'s Double.....60%
Bemis & Call Co.'s (Call's Pat. Inside) 30%
Excelsior.....50%
J. Stevens & Co.'s Callipers and Dividers
25&10%
Starrett's Spring Callipers and Dividers
25&10&10%
Starrett's Lock Callipers and Dividers
25&10%
Starrett's Combination Dividers.....25&10%

Coopers' Tools—

Bradley's.....20%
Barton's.....20@20&5%
L. & J. White.....20&5%
Albertson Mfg. Co.....25%
Beady's.....40&40&5%
Sandusky Tool Co.....30@30&5%

Corkscrews—

Humason & Beckley Mfg. Co. 40&40&10%
Clough's Pat.....33%&33%&5%
Howe Bros & Hulbert.....35%

Corn Knives and Cutters—

Bradley's.....10%
Wadsworth's.....25%

Cradles—

Grain.....50&2%

Crow Bars—

Cast Steel.....\$ doz \$4
Iron, Steel Points.....\$ doz \$3 1/2

Curry Combs—

Fitch's.....50&10&50&10&10%
Rubber.....per doz \$10.00, dis 20%
Perfect.....50%

Curtain Pins—

Silvered Glass.....net
White Enamel.....net

Cutlery—

Beaver Falls & Booth's.....33%
Wostenholme.....\$7.75 to 2

Dampers, &c—

Dampers, Buffalo.....50%
Buffalo Damper Clips.....50%
Crown Damper.....40%
Excelsior.....40&10%

Dividers—

See Compasses.

Dog Collars—

Embossed, Gilt, Pope & Steven's list
30&10%
Leather, Pope & Steven's list.....40%
Brass, Pope & Steven's list.....40%

Door Springs—

Torrey's Rod, regular size.....\$ doz \$1.30
Gray's.....\$ gr. \$20.00, dis 20%
Bee Rod.....\$ doz \$2.50, dis 20%
Warner's No. 1, \$ doz, \$2.50; No. 2,
\$3.30; dis 40&10&50%

Gem (Coll), list April 19, 1886.....10%
Star (Coll), list April 19, 1886.....10%
Victor (Coll).....60&60&10%
Champion (Coll).....60&10&60&10&10%
Philadelphia.....5 in., \$5.00; 8 in., \$7.75;
dis 35%
Cowell's.....No. 1, \$ doz, \$18.00; No. 2,
\$15.00, dis 50%
Rubber, complete.....\$ doz, \$4.50; dis
55&10%

Hercules.....50%
Shaw Door Check and Spring.....25@30&35%

Drawing Knives—

P. S. & W.....75&5%
Mix.....75&10%
New Haven and Middlesex.....75&10%
Merrill.....60&10&10%
Wetherby & Douglass.....75&75&5%
L. & J. White.....15&10&25%
Bradley's.....35%
Adjustable Handle.....25@33 1/2%
Wilkinson's Folding.....25&25&5%

Drills and Drill Stocks—

Blacksmiths'.....each \$1.75
Blacksmiths' Self-Feeding.....each \$7.50,
dis 20%
Breast, P. S. & W.....40&10%
Breast, Wilson's.....30&5%
Breast, Millers Falls.....each \$3.00, dis 25%
Breast, Bartholomew's.....each \$2.50, dis
25&10&40%
Ratchet, Merrill's.....20@20&5%
Ratchet, Ingersoll's.....25%
Ratchet, Parker's.....20@20&5%
Ratchet, Whitney's.....20&10%
Ratchet, Weston's.....20@20%
Ratchet, Moore's Triple Action.....25@30%
Whitney's Hand Drill, Plain, \$11.00;
Adjustable, \$12.00.....dis 20&10%
Wilson's Drill Stocks.....10%
Automatic Boring Tools.....each \$1.75@
\$1.85

Drill Bits—

Morse.....50&10&5%
Standard.....50&10&5%
Syracuse.....50&10&5%
Cleveland.....50&10&5%
Williams.....50&10&10%

Drill Bits—See Augers and Bits.**Drill Chucks—See Chucks.****Dripping Pans—**

Small sizes.....\$ doz \$6 1/2
Large sizes.....\$ doz \$6 1/2

Egg Beaters—

Dover.....\$ doz \$2.00
National.....\$ doz \$4.50, dis 33 1/2%
Family (T. & S. Mfg. Co.), \$ gro \$17.00@
\$18.00
Duplex (Standard Co.).....\$ gro \$15.00
Rival (Standard Co.).....\$ gro \$12.00
Large Duplex (Standard Co.), \$ doz \$4.50
Triumph (T. & S. Mfg. Co.), \$ gro \$10.50
@ \$11.50

Advance, No. 1.....\$ gro \$10.50
Advance, No. 2.....\$ gro \$10.00
Bryant's.....\$ gro \$15.00
Ayres' Spiral.....\$ gro \$5.00
Double (Hamblin & Russell Mfg. Co.), \$
gro \$16.20

Easy (Hamblin & Russell Mfg. Co.), \$
gro \$14.00
Triple (Hamblin & Russell Mfg. Co.), \$
gro \$16.20
Spiral (Hamblin & Russell Mfg. Co.), \$
gro \$1.50

Paine, Diehl & Co.'s.....\$ gro \$24.00

Buffalo Steam Egg Poachers, \$ doz, No.
1, \$6.00; No. 2, \$9.00.....dis 25%

Electric Bell Sets—

Wollensak's.....20%
Bigelow & Dowse.....20%

Emery—No. 4 to No. 54 to Flour CF
40 gr. 150 gr. P. F.
Kegs, \$ doz \$4 1/2 5 1/2 2 1/2
1/4 kegs, \$ doz \$4 1/2 5 1/2 2 1/2
1/2 kegs, \$ doz \$4 1/2 5 1/2 2 1/2
10-lb cans, 10 6 1/2 5 1/2
In case.....6 1/2 5 1/2
10-lb cans, less than 10.....10 10 7 1/2

Enameled and Tinned Ware—
See Hollow Ware.

Escutcheon Pins—

Iron, list Nov. 11, 1885.....50&10&50&10&5%
Brass.....60&60&5%

Escutcheons.

Door Lock.....Same dis as Door Locks.
Brass Thread.....60&60&10%
Wood.....25%

Faucets—

Fenn's.....40%
Bohren's Pat. Rubber Ball.....25%
Fenn's Cork Stops.....33 1/2%
Frary's Pat. Petroleum.....40&5&2%
West's Pat. Key.....60&10%
Anchor Lock.....45%
Metallic Key, Leather Lined.....60&10%
Cork Lined.....70&5&70&10%
Burnside's Red Cedar.....60%
Burnside's Red Cedar, bbi lots.....50&10%
John Sommers' Peerless Best Block Tin Key.....40%
IXL, 1st quality, Cork Lined.....50%
Diamond Lock.....40%
Perfection, Fla. Red Cedar.....50%
Goodenough Cedar.....50%
Good Metallic Key.....60%
Reliable Cork Lined.....60%
Western Pattern Cork Lined.....50%
Self-Measuring Enterprise, \$ doz \$50.00,
dis 20&10%
Self-Measuring, Lane's, \$ doz \$36.00,
dis 25&10%
Self-Measuring, Victor, \$ doz \$36.00,
dis 25&10%

Felloe Plates.....\$ doz \$6 1/2

Fifth Wheels—

Derby and Cincinnati.....45&5%

Files—

Domestic.....60&5&60&10%
Nicholson Files, Rasps, &c.....60&5&60&10%
Nicholson (X. F.) Files.....25%
Nicholson's Royal Files (Seconds)
75% (extra prices on certain sizes)
Other makers, best brands.....60&5&60&10&5%
Fair brands.....60&10&10&70%
Second quality.....70&5&75%
Heller's Horse Rasps.....50&7 1/2@50&10%
McCauley's Horse Rasps.....50&10%

Imported.....
J. & Riley Carr.....1st, April 1, 1883, 15%
J. & Riley Carr Horse Rasps.....10%
Moses & Gamble.....1st, April 1, 1883, 15%
Butcher.....Butcher's list, 20%
Stubbs.....Stubbs list, 25@30%
Turton's.....Turton's list, 20@25%
Greaves' Horse Rasps, American list, 60%

Fluting Machines—
Knox, 1/4-inch Rolls.....\$3.25 each } 35%
Knox, 3/8-inch Rolls.....\$3.80 each } 35%
Eagle, 3/4-inch Roll.....\$2.15, dis 35%
Eagle, 1/2-inch Roll.....\$2.85, dis 35%
Crown, 1/2 in., \$3.50; 3/4 in., \$4.00; 1 in.,
\$6.50 each.....dis 35%
Crown Jewel, 6 in.....\$3.50 each, 35%
American, 5 in., \$3.00; 6 in., \$3.40; 7 in.,
\$4.50 each.....dis 35%
Domestic Fluter.....\$1.50 each net
Geneva Hand Fluter, White Metal.....\$ doz \$12, dis 25%
Crown Hand Fluter, Nos. 1, \$15.00; 2,
\$12.50; 3, \$10.00.....dis 30%
Shepard Hand Fluter, No. 85 \$ doz
\$15.30.....dis 40%
Shepard Hand Fluter, No. 110 \$ doz
\$11.00.....dis 40%
Shepard Hand Fluter, No. 95 \$ doz
\$8.00.....dis 40%
Clark's Hand Fluter, \$ doz \$15.00, dis 35%
Combined Fluter and Sad Iron,
\$ doz \$15.00, dis 30%
Buffalo.....\$ doz \$10.00, dis 10%

Fluting Scissors.....45%

Fodder Squeezers—

Blair's.....\$ doz \$2.00
Blair's "Climax".....\$ doz \$1.25

Forks—

Hay, Manure, &c., Asso. List.....65%
Hay, Manure, &c., Phila. List.....60&60&5%
Plated, see Spoons.

Freezers, Ice Cream—

Buffalo Champion.....60&10&5%
Shepard's Lightning.....65%
White Mountain.....60%

Fruit and Jelly Presses—

Enterprise Mfg. Co.....20&10&30%
Hens.....\$ doz \$3.75@4.00
P. D. & Co.....\$ doz \$3.75@4.00
Shepard's Queen City.....40%

Fry Pans—

High List.....75&5@75&10
No.....0 1 2 3 4
\$ doz \$3.75 \$4.70 \$5.90 \$6.95 \$8.55
No.....5 6 7 8
Low List.....\$7.50 \$8.75 \$10.00 \$11.25
No.....0 1 2 3 4
\$ doz \$3.00 \$3.75 \$4.25 \$4.75 \$5.25
No.....5 6 7 8
\$ doz \$6.00 \$7.00 \$8.00 \$9.00

Fuse—

Common Hemp Fuse, for dry ground.....\$2.70
Common Cotton Fuse, for dry ground 2.85
Single Taped Fuse, for wet ground.....4.75
Double Taped Fuse, for very wet gr.....6.00
Triple Taped Fuse, for very wet gr.....7.25
Small Gutta Percha Fuse, for water.....7.50
Large Gutta Percha Fuse, for water.....12.00

Gauges—

Marking, Mortise, &c.....60&10%
Starrett's Surface, Center and Scratch,
25&10%
Wire, low list.....10&10%
Wire, Wheeler, Madden & Co.....10%
Wire, Morse's.....50&50&5%
Wire, Brown & Sharpe's.....10&20%

Gimlets—

Nail and Spike.....50&10&5%
"Eureka" Gimlets.....40&10%
"Diamond" Gimlets.....\$ gr \$5.00
Double Cut, Shepardson's.....45&45&5%
Double Cut, Ives'.....60&60&5%
Double Cut, Douglass'.....40&10%
"Bee".....\$ gr \$12, dis 25&25&5%

Glue—

Le Page's Liquid.....25@25&5%
Upton's Liquid.....35%
Le Page & Co.'s Improved Process
25@25&5%

Glue Pots—

Tinned and Enameled.....40&40&5%
Family, Howe's "Eureka".....40%
Family, L. F. C.'s "Handy".....50%

Grindstones—

Small, at factory.....\$ ton \$7.50@9.00

Grindstone Fixtures—

Sargent's Patent.....70&10%
Reading Hardware Co.....50&10%

Hack Saws—

See Saws.

Halters—

Covert's, Rope, 1/4-in. Jute.....50&2%
Covert's, Rope, 1/4-in. Hemp.....40&2%
Covert's Adj. Rope Halters.....40&2%
Covert's Hemp Horse and Cattle Tie
50&2%
Covert's Jute Horse and Cattle Ties,
60&10&2%

Hammers—

Handled Hammers—
Maydole's, list Dec. 1, '85.....25@25&10%
Buffalo Hammer Co. } List Jan. 15, '87
Humason & Beckley } 50&50&10%
Atha Tool Co. } 40&10&50%
Payette R. Plumb } 40&10&50%
C. Hammond & Son } 40&10&50%
Verree.....5%
Magnetic Tack, Nos. 1, 2, 3, \$1.25, 1.50 &
1.75.....dis 30&10%
Nelson Tool Works.....40&10%
Warner & Nobles.....20&25%
Peck, Stow & Wilcox.....40%
Sargent's.....33 1/2@10%

Heavy Hammers and Sledges—
3 lb and under.....\$ doz \$40¢ } 60&10%
3 to 5 lb.....\$ doz \$54¢ } 60&10%
Over 5 lb.....\$ doz \$60¢ } 60&10%
Wilkinson's Smiths.....10%&11¢ per lb

Handcuffs and Leg Irons—
Providence Tool Co., Handcuffs, \$15.00
\$ doz.....dis 10%
Providence Tool Co., Leg Irons, \$25.00
\$ doz.....dis 10%
Tower's.....dis 25%
Daley's Improved Handcuffs, 2 Hands,
Polished, \$ doz \$48.00; Nickle-
doz \$57.00; 3 Hands, Polished, \$ doz
\$72.00; Nickle- doz \$84.00.....dis 25%

Handles, Wood—

Saw and Plane.....40&10&40&10&5%
Hammer, Hatchet, Axe, Sledge, &c.....40%
Brad Awl.....\$ gr \$2.00
Hickory Firmer Chisel, ass'd.....\$ gr \$5.00
Hickory Firmer Chisel, large.....\$ gr \$5.00
Apple Firmer Chisel, ass'd.....\$ gr \$5.00
Apple Firmer Chisel, large.....\$ gr \$5.00
Socket Firmer Chisel, ass'd.....\$ gr \$3.00
Socket Framing Chisel, ass'd.....\$ gr \$5.00
J. S. Smith & Co.'s Pat. File.....50%
File, assorted.....\$ gr 2.75; dis 40%
Auger, assorted.....\$ gr 5.00; dis 40%
Auger, large.....\$ gr 7.00; dis 40%
Pat. Auger, Ives'.....30&10%
Pat. Auger, Douglass'.....\$ set \$1.25 net
Pat. Auger, Swan's.....\$ set \$1.00 net
Hoe, Rake, Shovel, &c.....50&10%

Doors or Thumb.

Cross-Cut Saw Handles—
 Atkins' No. 1 Loop, pair, 30¢; No. 3, 22¢; No. 2 and No. 4 Reversible, 22¢.
 Boynton's Loop Saw Handles, 50¢, dis 80¢.
 Champion, 15¢.

Hangers—
 Barn Door, old patterns, 60¢10¢10¢70¢.
 Barn Door, New England, 60¢10¢10¢70¢.
 Samson Steel Anti-Friction, 55¢.
 Orleans Steel, 55¢.
 Hamilton Wrought Wood Track, 55¢.
 U. S. Wood Track, 55¢.
 Champion, 60¢10¢.
 Rider and Wooster, Medina Mfg. Co.'s list.
 Climax Anti-Friction, 70¢.
 Climax Steel Anti-Friction, 50¢.
 Zenith for Wood Track, 55¢.
 Reed's Steel Arm, 50¢.
 Challenge, Barn Door, 50¢.
 Sterling's Imp'vd (Anti-Friction), 55¢10¢.
 Victor, No. 1, \$15.00; No. 2, \$16.00; No. 3, \$18.00.
 Cheritree, 50¢10¢.
 Kiddier, 50¢10¢60¢.
 The "Boss", 60¢.
 Best Anti-Friction, 80¢.
 Duplex (Wood Track), 60¢.
 Terry's Pat., 4 in. pr. 4 in., \$10.00; 5 in., \$12.00.
 Cronk's Pat., No. 4, \$12.00; No. 5, \$14.40; No. 6, \$18.00.
 Wood Track Iron Clad, 7 ft. 10¢, dis 60¢.
 Carrier Steel Anti-Friction, 50¢50¢55¢.
 Architect, 50¢.
 Eclipse, 20¢10¢.
 Felix, 50¢.
 Richards, 30¢30¢10¢.
 Lane's Steel Anti-Friction, 40¢10¢.
 Ball Bearing Door Hanger, 20¢10¢25¢10¢.
 Warner's Pat., 20¢20¢10¢.
 Stearns' Anti-Friction, 20¢20¢10¢.
 Stearns' Challenge, 25¢10¢25¢10¢10¢.
 Pantless, 40¢40¢55¢.
 American, 50¢.
 Rider & Wooster, No. 1, 62¢; No. 2, 75¢.
 Paragon, Nos. 1, 2 and 3, 40¢10¢.
 Paragon, Nos. 5, 6, 7 and 8, 20¢10¢.
 Crescent, 60¢60¢10¢.
 Nickel Cast Iron, 50¢.
 Nickel, Malleable Iron and Steel, 40¢.
 Scranton Anti-Friction Single Strap, 33¢.
 Scranton Anti-Friction Double Strap, 40¢.
 Universal Anti-Friction, 40¢.
 Wild West, 4 in. Wheel, \$15.00; 5 in. Wheel, \$21.00.
 Star, 40¢10¢40¢10¢55¢.
 May, 50¢50¢10¢.
 Barry, \$6.00, dis 40¢10¢.

Harness Snaps—
 See Snaps.

Hatchets—

List Jan. 1, 1889.
 Isaiah Blood, 35¢40¢.
 Hunt's Shingling, Lath and Claw, 40¢55¢.
 Hunt's Broad, 40¢.
 Buffalo Hammer Co., 40¢10¢50¢.
 Hurd's, 40¢10¢50¢.
 Fayette R. Plum, 40¢10¢50¢.
 Wm. Mann, Jr. & Co., 50¢50¢55¢.
 Underhill Edge Tool Co., 40¢10¢40¢10¢.
 Underhill's, Haines and Bright goods, 33¢40¢.
 C. Hammond & Son, 40¢10¢50¢.
 Simmons, 40¢10¢40¢10¢55¢.
 Peck's, 40¢10¢40¢10¢55¢.
 Kelly's, 50¢50¢55¢.
 Sargent & Co., 50¢.
 Ten Eyck Edge Tool Co., 40¢10¢40¢10¢55¢.
 Collins, following list.
 Shingling, Nos. 1, 2, 3, 50¢.
 Claw, Nos. 1, 2, 3, 50¢.
 Lathing, Nos. 1, 2, 3, 50¢.
 Hay and Straw Knives—
 Lightning, Mfrs' price 50¢, dis 18.00.
 Jobbers' Extras, 25¢.
 Electric, 50¢.
 Gem, 50¢.
 Wadsworth's, 40¢75¢40¢10¢.
 Carter's Needle, 50¢.
 Heath's, 50¢.
 Auburn Hay, Common and Spear Point, 50¢.
 Auburn Hay, 40¢.

Hinges—
Wrought Iron Hinges
 Strap and T, 75¢75¢55¢.
 Screw Hook and Strap, 14 to 20 in., 30¢.
 Heavy Welded Hook, 14 to 20 in., 30¢.
 Screw Hook and Eye, 14 in., 50¢.
 Rolled Blind Hinges, Nos. 32 and 34, 50¢10¢.
 Rolled Blind Hinges, Nos. 232 and 234, 55¢10¢.
 Rolled Plate, 70¢10¢.
 Plate Hinges, 8, 10 and 12 in., 50¢.
 "Providence", over 12 in., 40¢.

Spring Hinges—
 Gear's Spring and Blank Butts, 40¢.
 Union Spring Hinge Co.'s list, March, 1889, 20¢.
 Acme and U. S., 30¢.
 Empire and Crown, 20¢.
 Hero and Monarch, 50¢.
 American, Gem, and Star, Japanned, 20¢.
 American, Gem, and Star, Bronzed, net.
 Barker's Double Acting, 20¢10¢.
 Union Mfg. Co., 20¢.
 Bommer's, 30¢.
 Buckman's, 15¢20¢.
 Chicago, 30¢.
 Wiles, 10¢.
 Devore's, 40¢.
 Rex, 40¢.

Gate Hinges—
 Western, 50¢.
 N. E. Reversible, 50¢.
 Clark's, Nos. 1, 2, 3, 60¢10¢55¢.
 N. Y. State, 50¢.
 Automatic, 50¢.

Common Sense, 50¢.
 Seymour's, 45¢10¢.
 Shepard's, 60¢10¢55¢.
 Reed's Latch and Hinges, 50¢.
 Blind Hinges—
 Parker, 75¢25¢.
 Palmer, 50¢55¢10¢.
 Seymour, 70¢25¢.
 Nicholson, 45¢10¢.
 Huffer, 50¢.
 Clark's, Nos. 1, 3, 5, 40 and 50, 75¢10¢50¢.
 Clark's Mortise Gravity, 50¢.
 Sargent's, Nos. 1, 3, 5, 11, 13, 75¢10¢75¢10¢55¢.
 Reading's Gravity, 75¢10¢75¢10¢55¢.
 Shepard's Noiseless Niagara, Buffalo, 75¢10¢55¢.
 Champion Steamboat, Clark's Old Pattern and Clark's Tip Pattern, 75¢10¢55¢.
 Shepard's O. S., Lull & Porter, 75¢10¢.
 Shepard's Acme, Lull & Porter, 75¢10¢.
 Shepard's Queen City Reversible, 75¢.
 Clark's Lull & Porter, Nos. 1, 3, 5, 75¢10¢55¢.
 North's Automatic Blind Fixtures, No. 2, for Wood, \$10.50; No. 3, for Brick, \$13.50.
 Hoos—
 Garden, Mortar, &c., 55¢.
 Planter's, Cotton, &c., 55¢.
 Warren Hoe, 60¢.
 Magic, 50¢.

Handled—
 D. & H. Scovill, 20¢.
 Lane's Crescent Planter's Pattern, 45¢25¢.
 Lane's Razor Blade, Scovill Pattern, 30¢.
 Maynard, S. & O. Pat., 45¢25¢.
 Sandusky Tool Co., S. & O. Pat., 60¢.
 Hubbard & Co., S. & O. Pat., 60¢.
 Chattanooga Tool Co., S. & O. Pat., 60¢.
 Grub, 60¢60¢10¢.

Hog Rings and Ringers—
 Hill's Improved Ringers, 50¢.
 Hill's Old Style Ringers, 50¢.
 Hill's Tongs, 50¢.
 Hill's Rings, 50¢.
 Perfect Rings, 50¢.
 Blair's Hog Ringers, 50¢.
 Blair's Hog Ringers, 50¢.
 Champion Rings, 50¢.
 Champion Rings, Double, 50¢.
 Brown's Ringers, 50¢.
 Brown's Ringers, 50¢.

Holding Apparatus—
 "Moore's" Hand Holst, with Lock, 30¢.
 "Moore's" Differential Pulley Block, 40¢.
 Energy Mfg. Co.'s, 35¢.

Holders, File and Tool—
 Balz Pat., 50¢.
 Nicholson File Holders, 20¢.

Hollow-Ware—
 Stove Hollow-Ware, Ground, 60¢55¢60¢10¢.
 Stove Hollow-Ware, Unground, 60¢10¢60¢10¢10¢.
 Enameled and Tinned Hollow-Ware, 55¢10¢.
 Oval Boilers, Saccapans and Glue Pots, 40¢40¢55¢.
 Gray Enameled Ware, 50¢10¢50¢10¢55¢.
 Agate and Granite Ware, 25¢.
 Rustless Hollow-Ware, 50¢50¢55¢.
 Galvanized Tea-Kettles—
 Inch 6 7 8 9
 Each, 55¢ 60¢ 65¢ 75¢

Cast Iron—
 Bird Cage, Sargent's list, 60¢10¢10¢.
 Bird Cage, Reading list, 60¢10¢10¢.
 Clothes Line, Sargent's list, 60¢10¢60¢10¢10¢.
 Ceiling, Sargent's list, 55¢10¢10¢.
 Harness, Reading list, 55¢10¢55¢10¢10¢.
 Coat and Hat, Sargent's list, 55¢10¢60¢10¢.
 Coat and Hat, Reading list, 50¢10¢50¢10¢10¢.
 Cotton Pat. (N.Y. Mallet & Handle Wks.), 30¢.
 Tassel and Picture (T. & S. Mfg. Co.), 30¢.
 Wrought Staples, Hooks, &c., See Wrought Goods.
Wire—
 Wire Coat and Hat, Gem, list April, 1889, 45¢.
 Wire Coat and Hat, Miles', list April, 1889, 45¢.
 Indestructible Coat and Hat, 45¢.
 Wire Coat and Hat, Standard, 45¢.
 Belt, 75¢10¢60¢.

Miscellaneous.
 Grass, No. 2, \$2.00; No. 3, \$2.25; No. 4, \$2.50.
 Bush, 55¢60¢.
 Whitteer's Patent, 55¢.
 Hooks and Eyes—Malleable Iron, 70¢70¢10¢.
 Fish Hooks, American, 50¢.
 Bench Hooks, See Bench Stops.

Horse Nails—
 Nos. 6 7 8 9 10
 Ausable, 28¢ 26¢ 25¢ 24¢ 23¢.
 Clinton, Fin., 24¢ 22¢ 21¢ 20¢ 19¢.
 Essex, 28¢ 26¢ 25¢ 24¢ 23¢.
 Lyra, 25¢ 23¢ 22¢ 21¢ 20¢.
 Suov' den, 25¢ 23¢ 22¢ 21¢ 20¢.
 Putnam, 23¢21¢20¢19¢18¢.
 Vulcan, 23¢ 21¢ 20¢ 19¢ 18¢.
 Northwest'n, 25¢ 23¢ 22¢ 21¢ 20¢.
 Globe, 23¢ 21¢ 20¢ 19¢ 18¢.

Knives—
 Wilson's Butcher Knives, 25¢30¢.
 Ames' Butcher Knives, 25¢.
 Foster Bros' Butcher, &c., 40¢.
 Nichols' Butcher Knives, 40¢10¢.
 Ames' Shoe Knives, 20¢25¢.
 Ames' Bread Knives, 50¢.
 Moran's Shoe and Bread, 20¢.
 Hay and Straw, See Hay Knives.
 Table and Pocket, See Cutlery.
 Corn, Auburn Mfg. Co. Western Pat., 20¢.
 Corn, Auburn Mfg. Co. Crescent, 35¢.

Knobs—
 Door Mineral, 65¢68¢.
 Door Por. Jap'd, 75¢78¢.
 Door Por. Nickel, 82¢90¢2.25.
 Door Por. Plated, Nickel, 82¢90¢2.25.
 Drawer, Porcelain, 60¢10¢60¢10¢10¢.
 Hemacite Door Knobs, 40¢10¢50¢.
 Yale & Towne Wood, list Dec., 1888, 40¢.
 Furniture, Plain, 75¢ gro inch, dis 10¢.
 Furniture, Wrought, 25¢10¢.
 Base, Rubber Tip, 70¢10¢55¢.
 Picture, Judd's, 60¢10¢10¢70¢.
 Picture, Sargent's, 70¢10¢.
 Picture, Hemacite, 35¢55¢.
 Shutter, Porcelain, 65¢10¢.
 Carriage, Jap., 50¢ gro 80¢, dis 60¢10¢.

Ladders—
 Melting, Sargent's, 55¢10¢.
 Melting, Reading, 35¢10¢.
 Melting, Monroe's Pat., 50¢.
 Melting, P. S. & W., 35¢10¢40¢.
 Melting, Warner's, 30¢.

Lawn Mowers—
 Standard List, 50¢10¢.
 Quaker City, dis 60¢10¢.
 Enterprise, 60¢10¢.

Lanterns—
 Tubular, 50¢.
 Plain with Guards, 50¢.
 Lift Wire, with Guards, 50¢.
 Square Plain, with Guards, 50¢.
 Sq. Lift Wire, with Guards, 50¢.
 Without Guards, 25¢ per doz less.

Miscellaneous.
 Police, Small, \$6.00; Medium, \$7.25; Large, \$9.75, dis 20¢25¢.

Lemon Squeezers—
 Porcelain Lined, No. 1, 50¢.
 Wood, No. 2, 50¢.
 Wood, Common, 50¢.
 Dunlap's Improved, 50¢.
 Sammis, No. 1, \$5.00; No. 2, \$9; 12, \$18.
 Jennings' "Star", 50¢.
 Dean's, No. 1, 50¢; No. 2, \$3.35; 3, \$1.90.
 Little Giant, 50¢50¢55¢.
 King, 40¢55¢.

Lines—
 Cotton and Linen Fish, Draper's, 50¢.
 Draper's Chalk, 60¢.
 Draper's Mason's Linen, 84 ft., No. 1, \$1.25; No. 2, \$1.75; No. 3, \$2.25; No. 4, \$2.75; No. 5, \$3.25.
 Cotton Chalk, 50¢.
 Samson, Cotton, No. 4, \$2; No. 4, \$2.50.
 Silver Lake, Braided, No. 0, \$6.00; No. 1, \$6.50; No. 2, \$7.00; No. 3, \$7.50.
 Mason's Linen, No. 3, \$1.50; No. 4, \$2.00; No. 4, \$2.50.
 Mason's Colored Cotton, 45¢.
 Wire Clothes, No. 18, \$3.00; No. 19, \$3.00; No. 20, \$2.50.
 Ventilator Cord, Samson Braided, White or Drab Cot., 50¢.

A. C., 25¢ 23¢ 22¢ 21¢ 20¢.
 C. B. K., 25¢ 23¢ 22¢ 21¢ 20¢.
 Champlain, 28¢ 26¢ 25¢ 24¢ 23¢.
 New Haven, 28¢ 26¢ 25¢ 24¢ 23¢.
 Saranac, 23¢ 21¢ 20¢ 19¢ 18¢.
 Champlain, 25¢ 23¢ 22¢ 21¢ 20¢.
 Capewell, 28¢ 26¢ 25¢ 24¢ 23¢.
 Star, 23¢ 21¢ 20¢ 19¢ 18¢.
 Anchor, 23¢ 21¢ 20¢ 19¢ 18¢.
 Western, 23¢ 21¢ 20¢ 19¢ 18¢.
 Empire Bronzed, 14¢.

Horse Shoes—See Shoes Horse.
Hose, Rubber—
 Competition, 75¢10¢75¢10¢55¢.
 Standard, 70¢70¢10¢.
 Extra, 60¢60¢10¢.
 N. Y. B. & P. Co., Para, 30¢10¢.
 N. Y. B. & P. Co., Extra, 50¢.
 N. Y. B. & P. Co., Dundee, 60¢10¢55¢.

Hushers—
 Blair's Adjustable, 50¢.
 Blair's Adjustable Clipper, 7.00.

Jack Screws—See Screws.
Kettles—
 Brass, 7 to 17 in., 24¢.
 Brass larger than 17 in., 26¢ 23¢.
 Enameled and Tea Kettles, See Hollow-Ware.

Keys—
 Lock Ass'n list Dec. 30, 1888, 50¢10¢.
 Eagle, Cabinet, &c., 33¢42¢.
 Hotchkiss' Brass Blanks, 40¢.
 Hotchkiss' Copper and Tinned, 40¢.
 Hotchkiss' Pad, and Cab., 40¢.
 Watcher Bed Keys, 50¢.
 Wollensack Tinned, 50¢10¢.

Knife Sharpeners—
 Pardin's Applewood Handles, 50¢.
 Pardin's, 60¢.
 Pardin's Rosewood or Cocobolo, 50¢.
 Pardin's, 40¢.

Knives—
 Wilson's Butcher Knives, 25¢30¢.
 Ames' Butcher Knives, 25¢.
 Foster Bros' Butcher, &c., 40¢.
 Nichols' Butcher Knives, 40¢10¢.
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 Melting, Warner's, 30¢.

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 Mason's Linen, No. 3, \$1.50; No. 4, \$2.00; No. 4, \$2.50.
 Mason's Colored Cotton, 45¢.
 Wire Clothes, No. 18, \$3.00; No. 19, \$3.00; No. 20, \$2.50.
 Ventilator Cord, Samson Braided, White or Drab Cot., 50¢.

Locks, &c.—
 Door Locks, Latches, &c., List Dec. 30, '88, chgd Feb. 2, '87, dis 50¢10¢60¢55¢.
 Mallory, Wheeler & Co., list July, '88, 50¢10¢60¢.
 Sargent & Co., list Aug. 1, '88, 55¢22¢.
 Reading Hardware Co., list Feb. 2, '88, 55¢60¢10¢.
 Livingston & Co., 70¢.
 Note.—Lower net prices often made.
 Perkins' Burglar Proof, 60¢25¢.
 Plate, 59¢42¢.
 F. Many's "Extension Cylinder", \$10.50.
 Barnes Mfg. Co., 40¢40¢10¢.
 Yale Corrugated Key, 38¢45¢.
 Deltz Flat Key, 30¢.
 L. & C. Round Key Latches, 30¢10¢.
 L. & C. Flat Key Latches, 33¢42¢.
 Romer's Night Latches, 33¢42¢.
 Yale, new list, 33¢42¢.
 "Shepardson" or "U. S.", 55¢.
 "Felter" or "American", 40¢10¢.
 Seed's N. Y. Hasp Lock, 25¢.

Cabinets—
 Eagle, Gaylord Par., list March, '84, rev. ker and Corbin, Jan. 1, '85, 38¢42¢.
 Deltz, Nos. 38 to 39, 40¢.
 Deltz, Nos. 51 to 53, 40¢10¢.
 Deltz, Nos. 86 to 96, 30¢.
 Stoddard Lock Co., 30¢33¢45¢.
 "Champion" Night Latches, 40¢.
 Barnes Mfg. Co., 40¢40¢10¢.
 Eagle and Corbin Trunk, 25¢22¢.
 "Champion" Cab. and Combin, 33¢42¢.
 Yale, 38¢.
 Romer's, 25¢.

Padlocks—
 List Dec. 23, '84, 75¢75¢10¢.
 Yale Lock Mfg. Co.'s, 33¢42¢.
 Eagle, 25¢42¢.
 Eureka, Eagle Lock Co., 40¢42¢.
 Romer's, Nos. 0 to 91, 30¢.
 Romer's Scandinavian, &c., Nos. 100 to 508, 15¢.
 A. E. Deltz, 40¢.
 "Champion" Padlocks, 40¢.
 Hotchkiss, 30¢.
 "Star", 45¢.
 "Horsehoe", 40¢.
 Barnes Mfg. Co., 40¢40¢10¢.
 Romer's, 25¢.
 Scandinavian, 90¢90¢10¢.
 Frim's Pat. Scandinavian low list, 60¢.
 Ames Sword Co. up to No. 150, 40¢.
 Ames Sword Co. above No. 150, 50¢.

Lumber Tools.
 Ring Peavies, "Blue Line" Finish 50¢, dis 20.00.
 Ring Peavies, Common Finish 50¢, dis 18.00.
 Steel Socket Peavies, 50¢, dis 22.00.
 Mall Iron Socket Peavies, 50¢, dis 19.00.
 Cant Hooks, "Blue Line" Finish, per doz, 16.00.
 Cant Hooks, Common Finish, 50¢, dis 14.00.
 Cant Hooks, Mail, Socket Clasp, "Blue Line" Finish, 50¢, dis 14.00.
 Cant Hooks, Mail, Socket Clasp, Common Finish, 50¢, dis 14.50.
 Cant Hooks, Clip Clasp, "Blue Line" Finish, 50¢, dis 14.00.
 Cant Hooks, Clip Clasp, Common Finish, 50¢, dis 12.00.
 Hand Spikes, 50¢, dis 15.00; 8 ft., 30.00.

Pike Poles, Pike & Hook, 50¢, dis 13 ft., \$11.50; 14 ft., \$12.50; 16 ft., \$14.50; 18 ft., \$17.50; 20 ft., \$21.50.
Pike Poles, Pike only, 50¢, dis 12 ft., \$10.00; 14 ft., \$11.00; 16 ft., \$13.00; 18 ft., \$16.00; 20 ft., \$20.00.
Pike Poles, not ironed, 50¢, dis 12 ft., \$6.00; 14 ft., \$7.00; 16 ft., \$8.00; 18 ft., \$12.00; 20 ft., \$16.00.
Setting Poles, 50¢, dis 12 ft., \$14.00; 14 ft., \$15.00; 16 ft., \$17.00.
Swamp Hooks, 50¢, dis 18.00.

Lustre—
 Four-ounce Bottles, 50¢, dis 1.75; 7 gross, \$17.00.

Mallets—
 Hickory, 20¢10¢20¢10¢10¢.
 Lignumvite, 20¢10¢20¢10¢10¢.
 B. & L. Block Co., Hickory & L. V., 30¢60¢10¢.

Match Safes—
 Dangerfield's Self-Igniting, 50¢, dis 1.50.
 Mattocks, Regular list, 60¢55¢60¢10¢.

Meat Cutters—
 Dixon's 50¢.
 Nos. 1 2 3 4
 \$14.00 \$17.00 \$19.00 \$30.00, dis 40¢55¢.
 Woodruff's 50¢.
 Nos. 100 150
 \$15.00 \$18.00, dis 40¢55¢.

Champion 50¢.
 Nos. 200 300 400
 \$22.00 \$27.00 \$40.00, dis 40¢45¢.
Hales Pattern 50¢.
 Nos. 11 12 13
 \$27.00 \$33.00 \$45.00, dis 70¢70¢55¢.

American.
 Nos. 1 2 3 4B
 Each, \$5 \$7 \$10 \$25 \$50 \$80.
Enterprise.
 Nos. 10 12 22 32 42
 Each, \$3 \$5 \$8 \$16 \$25.
Pennsylvania.
 Nos. 1 2 3 4
 \$24.00 \$28.00 \$36.00 \$28.00.

Miles' Challenge 50¢.
 Nos. 1 2 3
 \$22.00 \$30.00 \$40.00, dis 45¢45¢10¢.
Home No. 1. 50¢, dis 26.00, dis 55¢10¢.
Draw Cut, each.
 Nos. 5 6 8
 \$50 \$75 \$80 \$225, dis 20¢25¢.
Beef Shavers (Enterprise). 20¢10¢30¢.
Chadborn's Smoked Beef Cutter. 50¢.

Mining Knives—
 Am. (2d quality), 50¢ gr. 1 blade, 7¢; 2 blades, \$12; 3 blades, \$18, net.
 Lethrop's, 20¢10¢.
 Smith's, 50¢, Single, \$2.00; Double, 50¢.
 Knapp & Cowles, 50¢10¢60¢.
 Buffalo Adjustable, 50¢, dis 3.00, dis 25¢.

Locks, &c.—
 Door Locks, Latches, &c., List Dec. 30, '88, chgd Feb. 2, '87, dis 50¢10¢60¢55¢.
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 Sargent & Co., list Aug. 1, '88, 55¢22¢.
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 Perkins' Burglar Proof, 60¢25¢.
 Plate, 59¢42¢.
 F. Many's "Extension Cylinder", \$10.50.
 Barnes Mfg. Co., 40¢40¢10¢.

Molasses Gates—
 Stebbin's Pat. 70¢ 70¢ 70¢
 Stebbin's Genuine 60¢ 10¢ 10¢
 Stebbin's Tinned Ends 40¢ 10¢
 Chase's Hard Metal 50¢ 10¢
 Bush's 20¢
 Lincoln's Pattern 70¢ 70¢ 10¢
 Weed's 20¢ 10¢

Boss, # doz:
 Nos. 1, 87; No. 2, 88; No. 3, 89; No. 4, 90.
 \$10. 60¢ 10¢ 10¢

Money Drawers— # doz, \$18¢ 25¢

Muzzles— # doz, \$3.00 dis 25¢

Safety— # doz, \$3.00 dis 25¢

Nails, see Trade Report.

Wire Nails & Brads, list July 14, '87

Wire Nails, Standard Penny— # keg \$2.50 dis \$2.60

Nail Puller—

Curless Hammer— # doz \$9, net

Giant, No. 1— # doz, \$30.00, 10¢

Pelican— # doz, \$30.00, dis 25¢

Boss— # doz, \$30.00, dis 30¢

Lightning— # doz \$21.00

Nail Sets—

Square— # gr, \$4.00¢ \$4.25

Round— # gr, \$3.25

Cannon's Diamond Point— # gr, \$12, 20¢

Nut Crackers—

Table (H. & B. Mfg. Co.)— 40¢

Blake's Pattern— # doz \$2.00, dis 10¢

Turner & Seymour Mfg. Co.— 50¢

Nuts—

Hot Pressed— 5.4¢ 5.9¢

Cold Punched— 5.4¢ 5.9¢

In lots less than 100, # b, add 1/4¢; 1-b boxes, add 1/4¢ to list.

Oakum—

Government— # b 7 1/2¢ @ 8¢

U. S. Navy— # b 6 1/2¢ @ 7¢

Navy— # b 5 1/2¢ @ 6 1/2¢

Oilers—

Zinc and Tin— 65¢ 65¢ 10¢

Brass and Copper— 50¢ 10¢ 10¢ 5¢

Malleable, Improved, No. 1— \$3.60; No. 2, \$4.00; No. 3, \$4.40 # doz

Malleable, Hammers, Old Pattern, same list 40¢

Prior's Pat. or "Paragon" Zinc— 60¢ 10¢ 10¢

Prior's Pat. or "Paragon" Brass— 50¢

Olmstead's Tin and Zinc— 60¢

Olmstead's Brass and Copper— 50¢

Broughton's Zinc— 60¢

Broughton's Brass— 50¢

Packing, Steam—

Standard— 60¢ 10¢ 60¢ 10¢ 10¢

Extra— 60¢ 10¢ 60¢

N. Y. B. & P. Co., Standard— 50¢ 10¢ 5¢

N. Y. B. & P. Co., Empire— 70¢

N. Y. B. & P. Co., Salamander— # b 65¢, dis 30¢

Jenkins' Standard— # b 80¢, dis 35¢

Miscellaneous—

American Packing— 10¢ 11¢ # b

Russia Packing— 13¢ 14¢ # b

Italian Packing— 13¢ 14¢ # b

Cotton Packing— 15¢ 17¢ # b

Jute— 7¢ 8¢ # b

Padlocks—

See Locks.

Pails—

Galvanized Iron—

Quarts— 10 12 14

Hill's Light Weight, # doz, \$2.75 3.00 3.25

Hill's Heavy Weight, # ds, 3.00 3.25 3.75

Whiting's— 2.75 3.00 3.25

Sidney Shephard & Co.— 2.80 3.00 3.40

Iron Clad— 2.75 3.00 3.25

Fire Buckets— 2.75 3.25 3.50

Buckets, see Well Buckets.

Indurated Fibre Ware—

Star Pails, 12 qt— # doz \$4.50

Fire, Stable and Milk, 14 qt— # doz \$5.50

Pencils—

Faber's Carpenters'— high list 50¢

Faber's Round Gilt— # gro \$5.25 net

Dixon's Lead— # gro \$4.50 net

Dixon's Lumber— # gro \$6.75 net

Dixon's Carpenters'— 40¢ 10¢

Picks—

Railroad or Adze Eye, 5 to 6, \$12.00; 6 to 7, \$13.00— dis 60¢ 5¢ 80¢ 10¢

Picture Nails—

Brass Head, Sargent's list— 50¢ 10¢ 10¢

Brass Head, Combination list— 50¢ 10¢

Porcelain Head, Sargent's list— 50¢ 10¢ 10¢

Porcelain Head, Combination list— 40¢ 10¢

Niles' Patent— 40¢

Pinking Irons— # doz 65¢ net

Pipe, Wrought Iron—

List March 23, 1887.

1 1/2 and under, Plain— 55¢

1 1/2 and under, Galvanized— 47 1/2¢

1 1/2 and over, Plain— 65¢

1 1/2 and over, Galvanized— 65¢

Boiler Tubes, Iron— 60¢

Plane Irons—

Plane Irons, Butcher's— \$6.00¢ \$5.25 to 2

Plane Irons, Buck Bros.— 30¢

Plane Irons, Auburn Tool Co.— This title

Sandusky Tool Co.— 30¢

Single and Cut— 30¢

Double— 40¢

L. & J. J. White— 25¢

Pliers and Nippers—

Button's Patent— 30¢ 10¢ 40¢

Hall's No. 2, 5 in., \$13.50; No. 4, 7 in., \$21.00 # doz dis 20¢ 10¢ 35¢

Humason & Beckley Mfg. Co.— 50¢ 50¢ 10¢

Gas Pliers— 60¢

Gas Pliers, Custer's Nickel Plated— 60¢ 5¢

Eureka Pliers and Nippers— 40¢

Russell's Parallel— 25¢

P. S. & W. Cast Steel— 50¢

P. S. & W. Tinnery's Cutting Nippers— add 6¢ dis 10¢

Carew's Pat. Wire Cutters— 30¢

Morrill's Parallel, # doz, \$12.00— 30¢ 5¢

Cronk's 8 in., \$15.00; 10 in., \$21.00— 40¢ 40¢ 5¢

Plumbs and Levels—

Regular List— 70¢ 10¢ 70¢ 10¢ 10¢

Disston's— 45¢ 10¢

Pocket Levels— 70¢ 10¢ 70¢ 10¢ 10¢

Davis Iron Levels— 30¢

Davis' Inclinoimeters— 10¢ 10¢

Poppers, Corn—

Round or Square, 1 qt.— # gr \$12.00¢ 15.00

Round or Square, 2 qt.— # gr \$25.00¢ 28.00

Post Hole and Tree Augers and Diggers—

Samson Post Hole Digger, # doz \$36.00— dis 25¢ 10¢

Fletcher Post Hole Augers, # doz \$36.00— dis 25¢

Eureka Diggers— # doz \$16.00¢ 17.00

Leed's— # doz \$8.00¢ 9.00

Vaughan's Post Hole Auger, # doz \$13.00¢ 14.00

Kohler's Little Giant— # doz \$18.00

Kohler's Hercules— # doz \$15.00

Kohler's New Champion— # doz \$10.00

Schneider— # doz \$18.00

Ryan's Post Hole Diggers— # doz \$24.00

Cronk's Post Bars, # doz \$30.00— dis 50¢ 5¢ 40¢ 10¢

Gibb's Post Hole Digger, # doz \$30.00— dis 40¢ 40¢ 10¢

Potato Parers—

White Mountain— # doz \$5.00¢ 5.50

Antrim Combination— # doz \$8.00

Hoosier— # doz \$13.50

Pruning Hooks and Shears—

Disston's Combined Pruning Hook and Saw— # doz \$18.00, dis 20¢ 10¢

Disston's Pruning Hook, # doz \$12.00— dis 20¢ 10¢

E. S. Lee & Co.'s Pruning Tools— 40¢

Pruning Shears, Henry's Pat # doz \$17.50¢ 19.00 net

Henry's Pruning Shears, # doz \$4.25¢ 4.50 net

Wheeler, Co.'s Combination, # doz \$12.00, dis 20¢

Dunlap's Saw and Chisel, # doz \$8.50— dis 30¢

J. Mallinson & Co., No. 1, \$5.25; No. 2, 7.25

Pulleys—

Hot House, Awning, &c.— 60¢ 10¢

Japanese Screw— 60¢ 10¢

Brass Screw— 60¢ 10¢

Japanned Slide— 60¢ 10¢

Japanned Clothes Line— 60¢ 10¢

Empire Sash Pulley— 55¢ 60¢

Moore's Sash, Anti-Friction— 50¢

Hay Fork, Solid Eye, \$4.00— 50¢

Hay Fork, \$4.50— 50¢ 10¢ 50¢ 10¢ 5¢

Hay Fork, "Anti-Friction," 5 in. Solid— \$5.70

Hay Fork, "F" Common and Pat.— 50¢

Bushed— 20¢

Hay Fork, Tarbox Pat. Iron— 30¢

Hay Fork, Reed's Self-Lubricating— 60¢

Shade Rack— 45¢

Tackle Blocks— See Blocks

Pumps—

Cistern, Best Makers— 50¢ 10¢ 60¢

Pitcher Spout, Best Makers— 60¢ 10¢ 60¢

Pitcher Spout, Cheaper Goods— 70¢ 5¢ 70¢ 10¢ 5¢

Punches—

Saddlers' or Drive, good quality, # doz 60¢ 45¢

Bemis & Call Co.'s Cast Steel Drive— 50¢ 5¢

Bemis & Call Co.'s Spring Steel Socket— 50¢ 5¢

Spring, good quality— # doz \$2.50¢ 2.80

Spring, Leach's Pat.— 40¢

Bemis & Call Co.'s Spring and Check— 40¢

Solid Timers— # doz \$1.44, dis 55¢

Tinnery's Hollow Punches— 20¢ 25¢

Rice Hand Punches— 15¢

Avery's Revolving— 30¢ 10¢

Avery's Saw-Set and Punch. See Saw Sets.

Rail—

Sliding Door, Wrt Brass, # b 35¢, dis 15¢

Sliding Door, Bronzed Wrt Iron # ft. 7¢

Sliding Door, Iron, Painted— # foot 4¢

Barn Door, Light In. 1/4 # 3/4

Per 100 feet— \$2.50 3.00 4.40, dis 10¢

B. D. for N. E. Hangers— Small. Med. Large.

Per 100 feet— \$2.15 2.70 3.25, net

Terry's Wrought Iron, # foot— 4 1/2¢ 5¢

Victor Track Rail, 7¢ # foot— dis 50¢ 2¢

Carrier Steel Rail, # foot— 4 1/2¢

Rakes—

Cast Steel, Association goods— 65¢

Cast Steel, outside goods— 60¢ 10¢ 70¢

Malleable— 70¢ 70¢ 5¢

Gibbs Lawn Rake— \$12.00, dis 50¢

Canton Lawn Rake— \$9.00, dis 50¢

Ft. Madison Prize Bow Brace and Peerless— 65¢

Fort Madison Steel Tooth Lawn Rake— \$8.00—

Razors—

J. R. Torrey Razor Co.— 20¢

Wostenholme and Butcher, \$10.00 to 2— dis 10¢

Razor Stroops—

Genuine Emerson— 60¢ 60¢ 5¢

Imitation— # doz \$2.00, dis 20¢ 10¢ 5¢

Torrey's— 20¢

Badger's Belt and Com— # doz \$2.00

Lamont Combination— # doz \$4.00

Rivets and Burrs—

Copper— 50¢ 50¢ 10¢

Iron, list Nov. 17, '87— 50¢

Rivet Sets— dis 50¢ 2¢ 50¢ 10¢

Rods—

Stair,

Machines—	
Flat Head, Iron.....	55¢
Round Head, Iron.....	50¢
Bench and Hand—	
Bench, Iron.....	55¢10¢55¢10¢10¢
Bench, Wood, Beech.....	70¢
Bench, Wood, Hickory.....	20¢10¢
Hand, Wood.....	25¢10¢25¢10¢5¢
Lag, Blunt Point.....	75¢75¢10¢
Coach and Lag, Gimlet Point.....	75¢
Bed.....	25¢5¢
Hand Rail, Sargent's.....	60¢10¢75¢
Hand Rail, H. & B. Mfg. Co.....	70¢10¢75¢
Hand Rail, Am. Screw Co.....	75¢
Jack Screws, Millers Falls list.....	50¢50¢25¢
Jack Screws, P. S. & W.....	35¢
Jack Screws, Sargent.....	60¢10¢60¢10¢5¢
Jack Screws, Stearns.....	40¢40¢10¢
Scroll Saws—	
Lester, complete, \$10.00.....	25¢
Rogers, complete, \$4.00.....	25¢
Barnes' Builders' and Cabinet Makers', \$15.....	25¢
Barnes' Scroll Saw Blades.....	35¢
Scythe Snaths.....	
50¢25¢	
Shears—	
American Cast Iron.....	75¢10¢75¢10¢5¢
Pruning (See Pruning Hooks and Shears)	
Barnard's Lamp Trimmers.....	70¢
Tinners'.....	20¢25¢
Seymour's, List, Dec. 1881.....	60¢10¢10¢60¢10¢10¢5¢
Heinich's, List, Dec. 1881.....	60¢10¢10¢60¢10¢10¢5¢
Heinich's Tailor's Shears.....	85¢
First quality C. S. Trimmers.....	80¢80¢10¢
Second quality C. S. Trimmers.....	80¢10¢80¢10¢10¢
Acme Cast Shears.....	10¢10¢
Diamond Cast Shears.....	10¢
Victor Cast Shears.....	75¢10¢75¢10¢5¢
Howe Bros. & Hulbert, Solid Forged Steel.....	40¢
Chicago Drop Forge & F. Co., Solid Steel Forged.....	70¢
Clausen Shear Co., Japanised.....	70¢
Clausen Shear Co., Nickel, same list.....	90¢
Sliding Door—	
N. W. & Co., list July, 1888.....	50¢10¢60¢5¢
R. & E. list Dec. 18, 1885.....	55¢20¢
Corbin's list.....	80¢10¢25¢
Patent Roller.....	60¢10¢25¢
Patent Roller, H. & B. Mfg. Co.....	75¢
Russell's Anti-Friction list Dec. 18, 1885.....	60¢25¢
Moore's Anti-Friction.....	60¢
Sliding Shutter—	
R. & E. list Dec. 18, 1885.....	60¢10¢25¢
Sargent's list.....	60¢10¢
Reading list.....	60¢10¢10¢
Ship Tools—	
L. & I. J. White.....	20¢5¢
Albertson Hg. Co.....	25¢
Shoes, Horse, Mule, &c.—	
Burden's, Perkins', Phoenix, at factory.....	\$4.00
Mule—	
Add 1¢ per kg to above prices.	
Or, Wrought—	
Ton lots.....	7¢ 9¢
1000 lb lots.....	7¢ 9¢
500 lb lots.....	7¢ 10¢
Shot—	
(Eastern prices 2¢ off, cash, 5 days.)	
Drop, 7 bag, 25 lb.....	\$1.20
Drop, 7 bag, 5 lb.....	.25
Buck and Chilled, 7 25 lb bag.....	1.45
Buck and Chilled, 7 5 lb bag.....	.34
Shovels and Spades—	
Ames' Shovels, Spades, &c., list Nov. 1, 1885.....	20¢
Norman—Jobbers frequently give 3¢ 7½¢ extra on above.....	
Griffith's Black Iron.....	50¢10¢
Griffith's C. S.....	60¢60¢10¢
Griffith's Solid C. S. R. Goods.....	20¢
Old Colony (Sanford Fork & Tool Co.) 20¢ St. Louis Shovel Co.....	20¢20¢7½¢
Hussey, Blinn & Co.....	15¢25¢
Hubbard & Co.....	20¢20¢7½¢
Lehigh Mfg. Co.....	20¢20¢7½¢
Payne Pettibone & Son, list January, 1886.....	30¢
Remington's (Lowman's Patent).....	30¢10¢40¢
Rowland's, Black Iron.....	50¢10¢
Rowland's Steel.....	60¢5¢60¢10¢
Shovels and Tongs—	
Iron Head.....	60¢10¢60¢10¢5¢
Brass Head.....	60¢10¢10¢
Skins, Thimble—	
Western list.....	75¢5¢75¢10¢
Columbus Wrt. Steel, list Nov. 1, 1887.....	20¢
Coldbrookdale Iron Co.....	50¢10¢
Utica P. S. T. Skins.....	60¢
Utica Turned and Fitted.....	35¢
Sieves—	
Buffalo Metallic, S. S. & Co.....	50¢25¢10¢
Barier Flour Sifters.....	70¢
Smith's Adjustable Sifters.....	70¢
Smith's Adjustable Milk Strainer.....	70¢
Smith's Adjustable F. & C. Strainer.....	70¢
Sieves, Wooden Rim—	
Iron.....	Plated.
70¢ 90¢	
85¢ 1.00	
1.10	
Slates—	
School, by case.....	50¢10¢
Snaps, Harness, &c.—	
Anchor (T. & S. Mfg. Co.).....	65¢
Fitch's (Bristol).....	50¢10¢
Hotchkiss.....	10¢
Andrews.....	10¢
Sargent's Patent Guarded.....	70¢10¢10¢
Oveft n, new list.....	40¢10¢
Oveft n, Patent.....	50¢5¢25¢
Covert, New R. E.....	60¢25¢
Covered Spring.....	60¢10¢10¢
Soldering Irons—	
Covert's Adjustable, list Jan. 1, 1886.....	35¢25¢
Spoke Shaves—	
Iron.....	45¢
Wood.....	30¢
Bailey's (Stanley R. & L. Co.).....	40¢10¢
Stearns.....	20¢10¢30¢
Spoke Trimmers—	
Bonney's.....	70¢ doz \$10.00, dis 50¢
Stearns.....	20¢10¢
Ives, No. 1, \$15.00; No. 2, \$12.00.....	55¢10¢
Douglas.....	70¢ doz \$9.00, dis 20¢
Spoons and Forks—	
Tinned Iron—	
Basting, Cen. Stamp. Co.'s list.....	70¢10¢
Solid Table and Tea, Cen. Stamp. Co.'s list.....	70¢10¢
Buffalo S. S. & Co.....	33¢25¢
Silver-Plated (4 mos. or 5¢ cash 30 days).....	60¢10¢25¢
Meriden Brit. Co., Rogers.....	50¢
C. Rogers & Bros.....	50¢
Rogers & Bro.....	50¢
Reed & Barton.....	50¢
Wm. Rogers Mfg. Co.....	50¢10¢60¢
Simpson, Hall, Miller & Co.....	60¢10¢
Holmes & Edwards Silver Co.....	50¢10¢
H. & E. Silver Co., Mexican Silver.....	50¢5¢
H. & E. Silver Co., Durham Silver.....	50¢5¢
German Silver.....	50¢5¢
German Silver, Hall & Elton.....	50¢5¢
Nickel Silver.....	50¢5¢50¢10¢5¢
Britannia.....	50¢10¢
Boardman's Flat.....	50¢10¢
Boardman's Nickel Silver.....	50¢
Boardman's Britannia Spoons, case lots.....	60¢
Springs—	
Elliptic, Concord, Platform and Half Scroll.....	60¢60¢5¢
Cliff's Bolster Springs.....	25¢
Squares—	
Steel and Iron.....	75¢10¢80¢
Nickel-Plated.....	75¢10¢80¢
Try Square and T Bevels.....	60¢10¢10¢70¢
Diston's Try Square and T Bevels.....	45¢10¢
Winterbottom's Try and Miter.....	30¢10¢
Starrett's Micrometer Caliper Squares.....	25¢
Avery's Flush Bevel Squares.....	30¢5¢
Staples—	
Fence Staples, Galvanized.....	Same price as Brd Wire
Fence Staples, Plain.....	See Trd. Rep.
Steelyards.....	
40¢10¢50¢	
Stocks and Dies—	
Blacksmith's Waterford Goods.....	30¢
Blacksmith's Butterfield's Goods.....	50¢80¢10¢
Blacksmith's Butterfield's Goods.....	30¢
Lighting Screw Plate.....	25¢30¢
Reece's New Screw Plates.....	33½¢25¢40¢
Stone—	
Hindostan No. 1, 3¢; Axe, 3½¢; Slips No. 1, 4½¢	
Sand Stone.....	7¢ 2½¢
Washita Stone, Extra.....	7¢ 19¢20¢
Washita Stone, No. 1.....	7¢ 14¢15¢
Washita Stone, No. 2.....	7¢ 10¢11¢
Washita Slips, No. 1, Extra.....	7¢ 38¢38¢
Washita Slips, No. 1.....	7¢ 24¢25¢
Arkansas Stone, No. 1, 4 to 6 in.....	7¢ 11¢5¢
Arkansas Stone, No. 1, 6 to 9 in.....	7¢ 11¢5¢
Turkey Oil Stone, 4 to 8 in.....	7¢ 40¢
Turkey Slips.....	7¢ 1.00¢1.50
Lake Superior Chase.....	7¢ 18¢
Lake Superior Slips, Chase.....	7¢ 31¢32¢
Seneca Stone, Red Paper Brand.....	18¢20¢
Seneca Stone, High Rounds.....	7¢ 20¢25¢
Seneca Stone, Small Whets.....	7¢ 24¢00
Stove Polish—	
Joseph Dixon's.....	7¢ 80¢, dis 10¢
Gem.....	7¢ 80¢, dis 10¢
Gold Medal.....	7¢ 80¢, dis 25¢
"Mirror".....	7¢ 80¢, dis 10¢
Lustro.....	7¢ 80¢, dis 10¢
Ruby.....	7¢ 80¢, dis 10¢
Blazing Sun, 5 gro lots.....	7¢ 80¢, dis 10¢
Dixon's Plumber.....	7¢ 80¢, dis 10¢
Boynton's Noon Day.....	7¢ 80¢, dis 10¢
Parlor Pride Stove Enamel.....	7¢ 13¢00
Yates Liquid, 2 3 5 10 gal. cans.....	7¢ 80¢, dis 10¢
Yates Standard Paste Polish, 10 lb cans.....	7¢ 80¢, dis 10¢
Jet Black.....	7¢ 80¢, dis 10¢
Japanese.....	7¢ 80¢, dis 10¢
Fireside.....	7¢ 80¢, dis 10¢
Diamond O. K. Enamel.....	7¢ 80¢, dis 10¢
Bonnell's Liquid Stove Polish.....	7¢ 80¢, dis 10¢
Bonnell's Paste Stove Polish.....	7¢ 80¢, dis 10¢
Black Eagle Benzine Paste, 5 and 10 lb cans.....	7¢ 80¢, dis 10¢
Black Jack Water Paste, 5 and 10 lb cans.....	7¢ 80¢, dis 10¢
Nickel Plate Paste.....	7¢ 80¢, dis 10¢
Tacks, Brads, &c.—	
List, Jan. 2, 1888.—[Note.—Some manufacturers are selling Tacks at slightly higher prices than those named.]	
American Iron Carpet.....	80¢80¢5¢
Steel Carpet.....	80¢80¢5¢
Swedes Iron Carpet.....	80¢80¢5¢
American Iron Cut.....	75¢75¢10¢
Swedes Iron.....	75¢75¢10¢
Swedes Iron, Upholsterers.....	75¢10¢75¢10¢5¢
Tinned Swedes Iron.....	75¢10¢75¢10¢5¢
Tinned Swedes Iron, Upholsterers.....	75¢10¢75¢10¢5¢
Gimp and Lace.....	75¢10¢75¢10¢5¢
Tinned Gimp and Lace.....	75¢10¢75¢10¢5¢
Swedes Iron Trimmers.....	75¢10¢75¢10¢5¢
Swedes Iron Miners.....	75¢10¢75¢10¢5¢
Swedes Iron Bill Posters or Railroad.....	75¢10¢75¢10¢5¢
Swedes Steel (Swedes Iron price list).....	80¢80¢5¢
Copper Tacks.....	80¢10¢
Copper Finishing, Trunk and Clout Nails.....	50¢10¢
Finishing Nails.....	70¢10¢70¢10¢10¢
Trunk and Clout Nails.....	70¢10¢70¢10¢10¢
Tinned Trunk and Clout Nails.....	70¢10¢
Basket Nails.....	70¢10¢70¢10¢10¢
Common and Patent Brads, 70¢10¢70¢10¢	
Hungarian Nails.....	70¢10¢70¢10¢10¢
Chair Nails.....	70¢10¢70¢10¢10¢
Zinc Glaziers' Points.....	50¢50¢5¢
Cigar Box Nails.....	50¢10¢50¢10¢5¢
Picture-Frame Points.....	50¢10¢50¢10¢5¢
Looking-Glass Tacks.....	50¢10¢50¢10¢5¢
Leather Carpet.....	50¢10¢50¢10¢5¢
Brush Tacks.....	50¢10¢50¢10¢5¢
Shoe Finders', List Jan. 2, 1888.....	10¢10¢
Lining and Saddle Nails, List Jan. 1, 1888.....	10¢10¢5¢
Silvered.....	30¢10¢10¢
Japaned.....	20¢10¢10¢
Double-Pointed Tacks.....	35¢
Wire Carpet Nails.....	50¢10¢
Wire Brads & Nails, see Nails, Wire.....	
Steel-Wire Brads, K. & E. Mfg. Co.'s list.....	50¢10¢
Tap Borers—	
Common and Rind.....	20¢10¢
Ive's Tap Borers.....	33½¢25¢
Enterprise Mfg. Co.....	20¢10¢30¢
Clark's.....	33½¢30¢
Tapes, Measuring—	
American.....	25¢10¢
Spring.....	40¢
Chesterman's, Regular list.....	25¢30¢
Thermometers—	
Tin Case.....	80¢80¢10¢
Thimble Skins—See Skins.	
Ties, Bale-Steel	
Standard Wire, list.....	50¢10¢5¢
Tinners' Shears, &c.—	
Shears and Snips (P. S. & W.).....	20¢25¢
Punches, see Punches.....	
Snips, J. Mallinson & Co.....	33½¢
Tinware—	
Stamped, Japaned and Pieced, list Jan. 20, 1887.....	75¢75¢5¢
Tire Benders, Upsetters, &c.—	
Stoddard's Lightning Tire Upsetters.....	15¢
Detroit Perfected Tire Bender.....	15¢
Tobacco Cutters—	
Champion.....	20¢10¢30¢
Wood Bottom.....	70¢50¢45¢25¢
All Iron.....	70¢50¢45¢25¢
Nashua Lock Co's.....	70¢50¢45¢25¢
Wilson's.....	55¢
Sargent's.....	70¢, dis 24¢, dis 55¢10¢
Acme.....	70¢, dis 20¢00, dis 40¢
Transom Lifters—	
Wollensak's Class 3 and 4, Bronzed Iron.....	50¢
Class 3 and 4, Bronze Metal.....	25¢
Class 3 and 4, Brass.....	35¢
Skylight Lifters.....	35¢
Crown, Eagle and Shield.....	50¢
Reinforced Bronzed Iron Rods, list Jan. 1, 1887.....	50¢25¢
Reinforced Real Bronze or Nickel Plate.....	50¢25¢
Excelstor.....	50¢10¢25¢
Shaw's.....	50¢10¢
Payson's Universal.....	40¢40¢10¢
Traps—	
Game—	
Newhouse.....	75¢40¢5¢
Nelda Pattern.....	30¢70¢5¢
Game, Blake's Patent.....	40¢10¢5¢
Mouse and Rat—	
Mouse Wood, Choker, 7 doz holes, 11¢12¢	
Mouse, Round Wire.....	70¢10¢
Mouse, Catch Wire.....	70¢10¢
Mouse, Catch-em-alive.....	70¢10¢
Mouse, "Bonanza".....	70¢10¢
Mouse, Delusion.....	70¢10¢
Rat, "Decey".....	70¢10¢
Ideal.....	70¢10¢
Cyclone.....	70¢10¢
Hotchkiss Metallic Mouse, 5-hole traps.....	70¢10¢
In full cases.....	70¢10¢
Trowels—	
Lothrop's Brick and Plastering.....	25¢
Reed's Brick and Plastering.....	15¢
Diston's Brk and Plastering.....	25¢25¢10¢
Peace's Plastering.....	25¢
Clemens & Maynard's.....	15¢30¢
Rose's Brick.....	25¢
Brade's Brick.....	25¢
Worrall's Brick and Plastering.....	20¢
Garden.....	70¢
Triers—	
Butter and cheese.....	25¢
Trucks, Warehouse, &c.—	
B. & L. Block Co.'s list '82.....	40¢
Tubes, Boiler—	
See Pipe.....	
Twine—	
Flax Twine—	
No. 9, 1/4 and 1/2 B Balls.....	22¢ 30¢
No. 12, 1/4 and 1/2 B Balls.....	22¢ 25¢
No. 18, 1/4 and 1/2 B Balls.....	18¢ 25¢
No. 24, 1/4 and 1/2 B Balls.....	18¢ 25¢
No. 36, 1/4 and 1/2 B Balls.....	16¢ 27¢
No. 264, Mattress, 1/4 and 1/2 B Balls.....	15¢50¢
Chalk Line, Cotton, 1/4 B Balls.....	25¢
Mason Line, Linen, 1/4 B Balls.....	55¢
2-Ply Hemp, 1/4 and 1/2 B Balls (Spring Twine).....	11¢
3-Ply Hemp, 1 B Balls.....	12¢12½¢
3-Ply Hemp, 1 1/2 B Balls.....	11¢11½¢
Cotton Wrapping, 5 Balls to lb.....	15¢16¢
2, 3, 4 and 5-Ply Jute, 1/4 B Balls.....	10¢
Wool.....	6¢6¢
Paper.....	13¢14¢
Cotton Mops, 6, 9, 12 and 15 lb doz.....	18¢
Vises—	
Solid Box.....	00¢00¢5¢
Parallel.....	
Fisher & Norris Double Screw.....	15¢10¢
Stephens.....	25¢30¢
Parker's.....	
20¢25¢	
Wilson's.....	55¢
Howard's.....	40¢
Bonney.....	40¢10¢
Millers Falls.....	40¢10¢
Trenton.....	40¢50¢10¢10¢
Merrill's.....	15¢20¢
Sargent's.....	60¢10¢10¢
Backus and Union.....	40¢
Double Screw Leg.....	15¢10¢
Prentiss.....	20¢5¢25¢
Simpson's Adjustable.....	40¢
Saw Filers—	
Bonney's, Nos. 2 & 3, \$15.00.....	dis 40¢10¢
Stearns.....	33½¢10¢33½¢10¢10¢
Stearns' Silent Saw Vises.....	33½¢35¢
Sargent's.....	60¢10¢
Hopkins.....	70¢10¢
Reading.....	20¢10¢
Wentworth.....	20¢10¢
Combination Hand Vises.....	70¢10¢
Cowell Hand Vises.....	20¢
Bauer's Pipe Vises.....	10¢
Wagon Boxes—	
Per b.....	2½¢
Wagon Jacks—	
Daisy.....	70¢ doz \$4.00, dis 25¢
Washer Cutters—	
Smith's Pat. 70¢ doz \$12.00, dis 20¢10¢10¢	
Johnson's.....	70¢ doz \$11.00, dis 33½¢
Penny's.....	70¢ doz \$11.00, dis 33½¢
Appleton's.....	70¢ doz \$11.00, dis 33½¢
Bonney's.....	70¢ doz \$11.0

JANUARY 30, 1889.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market reports.

&2	Red Indian Dry.	10
&2	Rose Pink	10

THE IRON AGE

THURSDAY, FEBRUARY 7, 1889.

The Railroad Presidents' Agreement.

In the amended document, which is now given to the public, the original agreement of the railroad presidents, known as the agreement of January 1, is taken from the body of the contract and placed at the head, as a prelude or introduction. This is followed by the articles of agreement, the first of which defines the objects of the association and the second the construction of the board of managers.

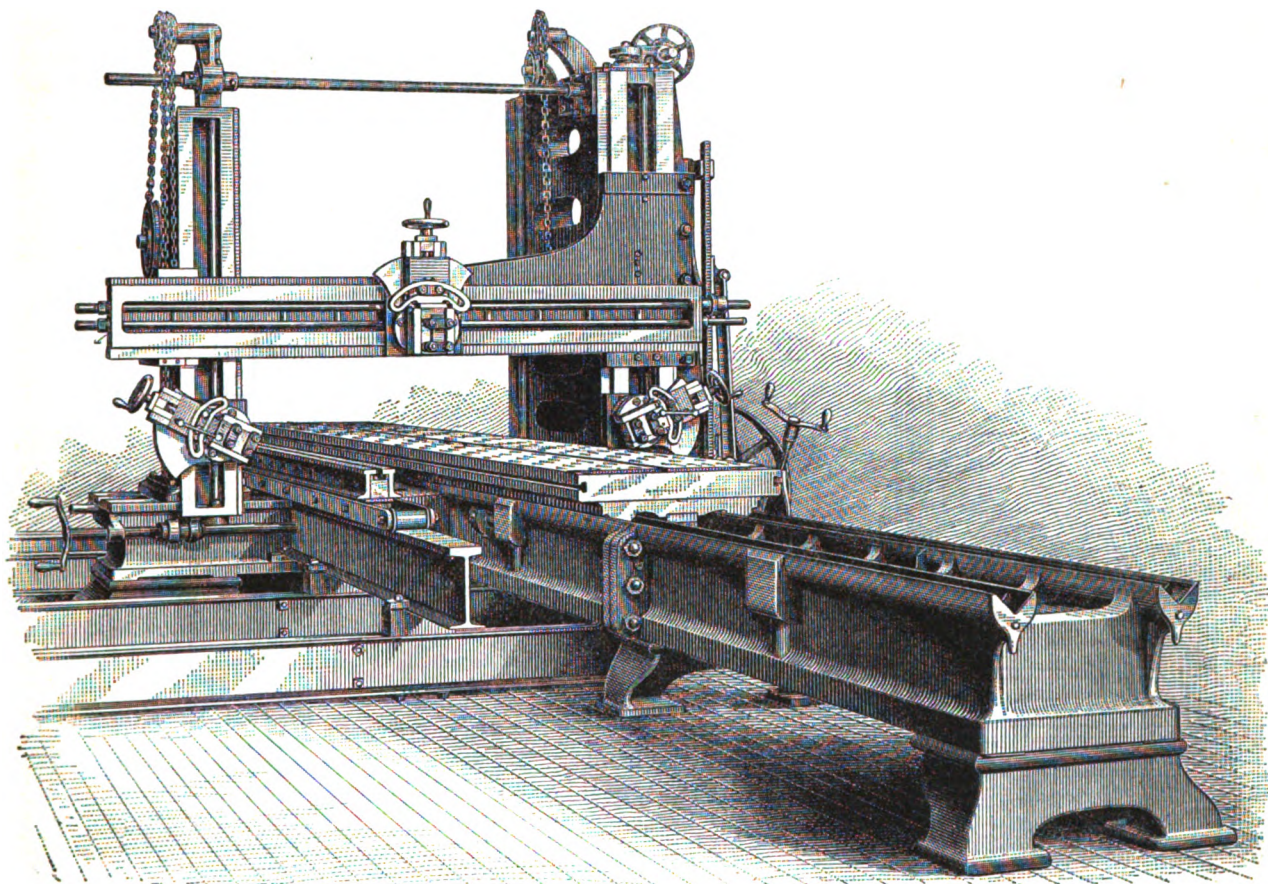
Article 3 is amended to read as follows: A rate committee appointed by the board of managers for the freight and passenger

alike by all lines; "provided, however, that when one road has a proprietary interest in another, the divisions between such roads shall be what they may elect, and shall not be the property of the association." * * *

Article 13 defines territory to be covered by the association as follows: The business to be covered by this agreement shall be all the State and interstate traffic, both freight and passenger, which is competitive between the parties hereto, or any two or more of them, when business has origin or destination in the States of Illinois, Iowa, Missouri, Kansas, Nebraska, Colorado, Wisconsin and Minnesota, and the

Open Side Planer.

The accompanying engravings show an open side planer, fitted with special extra post and bed. This addition, in combination with the advantages peculiar to the open-side machine, presents some very valuable features. The extra post is adjustable to and from the main bed, giving a horizontal travel of tool from 4 to 10 feet, as the piece of work demands. The head on the special post can be brought close up to and used if necessary on work of any width within the range of the 10 feet, the post, as before stated, being adjustable. The



OPEN SIDE PLANER, BUILT BY DETRICK & HARVEY, OF BALTIMORE, MD.

departments shall be constituted, whose province it shall be to establish rates, rules and regulations on the traffic subject to this association, and to consider changes therein, and make rules for meeting competition with outside lines. Their conclusion, when unanimous, shall be made effective when they so order; but if they differ, the question at issue shall be referred to the board of managers; and if they disagree, it shall be arbitrated by the executive board, as hereinafter provided. Notwithstanding the decision of the arbitrators, the company claiming the right to make any particular rate may, after such decision, make such rate on ten days' notice.

Article 4, relating to divisions of through rates, is also amended. It provides that divisions of through rates shall be arranged through the association, the intention being that bidding for business by means of private concessions shall cease, and that the divisions on corresponding traffic shall be opened to and

Territories of Utah, Wyoming, Dakota, New Mexico, Montana and the Indian Territory; except Pacific Coast business, now covered under the present agreement of the Transcontinental Association lines; Texas business, now covered under the present agreement of the International Association lines, and business between points north of the Ohio River and points south of the Ohio River, both of which are east of the Mississippi River.

The duration of the agreement is to be absolutely 90 days from January 1, 1889, subject to 30 days' notice thereafter of the desire of any party to withdraw from or amend the same, and in case any such notice shall be given, the chairman of the Executive Board shall forthwith call the presidents together to consider the matter. A special article provides that the Wabash becomes a party to this agreement only for that portion of its road from Chicago to East St. Louis and Hannibal, via Toluca, Ill.

The signatures have not all been made.

heads on the beam have automatic feeds in all directions, and the heads on the main and special posts have automatic vertical feed. Where the special post is used, as shown in the cut, a special rolling table is employed as also shown. This post and special bed can be removed and the tool used as an open side planer, with the standard supplemental rolling table, in the usual manner. The extra wide travel of tool across the table sometimes necessary is here accomplished without the very wide platens and beds which go to make up the planers of the regular style. The beam is counterbalanced at two points and is raised and lowered by power. The heads on the posts have also each a counterbalance. The saddles of the heads are in the form of a quadrant, thereby giving to the tool slide at the top a rigid support and making the head stiff and well adapted for heavy cuts. The feed mechanism is new and embodies simplicity of construction with great power, the four heads being operated at one time when necessary. It

requires power only when feeding. The platen is cored in a novel manner to adapt it for the rapid chucking of work. The holes are made square and tapering to use cast plugs for stop pins, and are adapted for the heads of standard machine bolts, not requiring those specially forged and fitted. These holes are so formed that they will not fill up with chips. The machine here shown planes 20 feet long and weighs 40,000 pounds. These planers are manufactured by Detrick & Harvey, of Baltimore, Md.

THE ROBERT PROCESS.

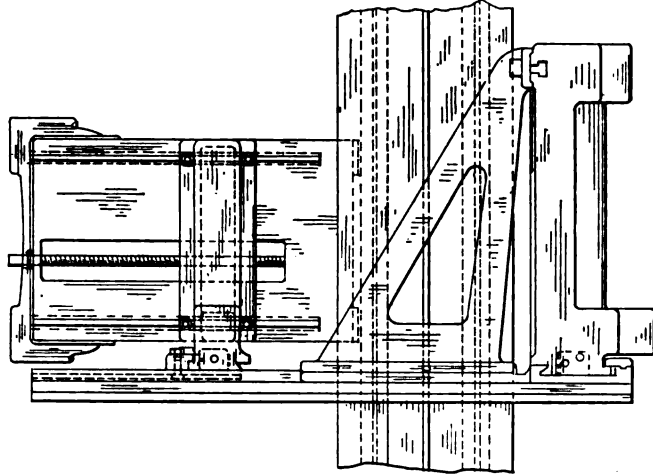
Some very extraordinary claims are being made for the process invented by G. Robert, a French engineer, whose method is experimentally at work at Springfield, Ohio, under the auspices of J. W. Bookwalter. With the disappointments of the Clapp-Griffiths process still lingering in the memory of many in the iron trade, this latest modification of the Bessemer method is received with some skepticism. We have received a number of communications from manufacturing concerns, to whose attention the merits of the new process have been called, asking for more detailed information. The promoters have promised *The Iron Age* an opportunity to investigate the process at Springfield, which has, however, been tempo-

marks a new departure in both the making of steel and wrought iron, and in the qualities they secure in the various uses to which they can be applied.

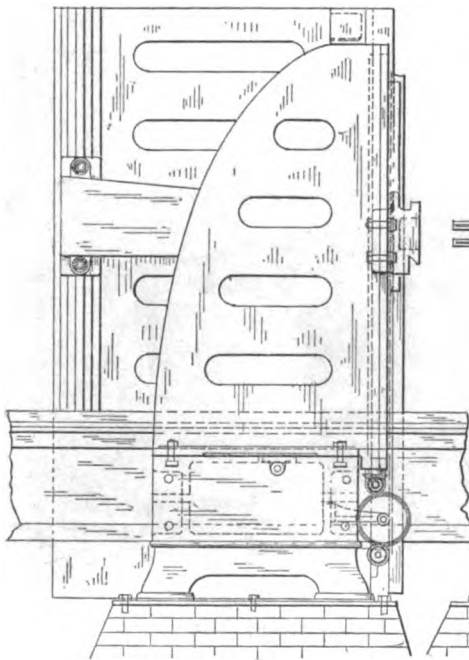
All this has been proven in the manufacture of thousands of tons at Stenay, France, during the past two years on contracts from the French Government, from various railways and manufacturers in that country. The works are run day and night, including Sundays. Since May 1 another works has been in operation in

days, exhaustively examining into the entire subject, he ordered a converter to be sent to his works in Wales; also several tons of the material of various kinds and forms were ordered by him for trial by various manufacturers of differing products.

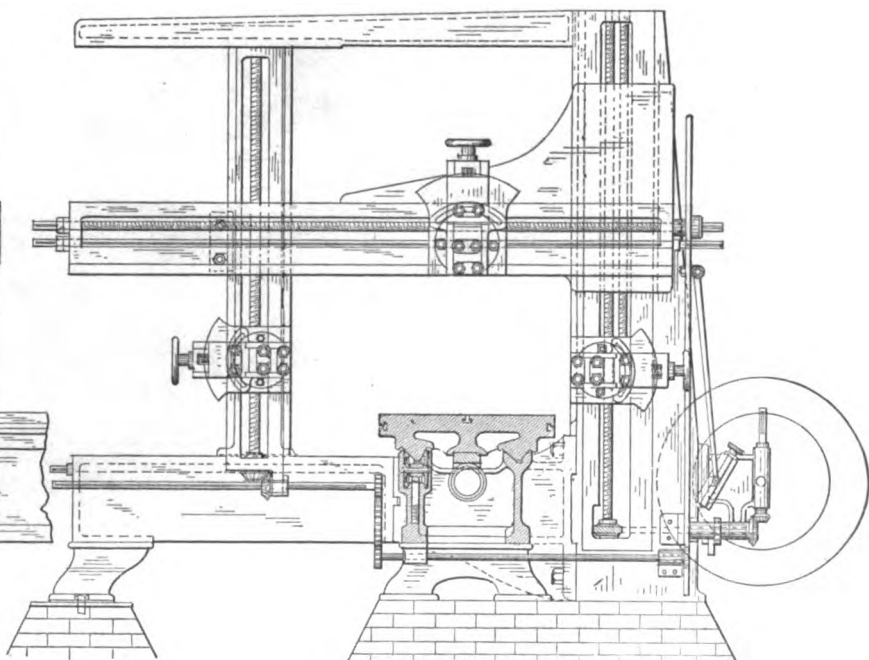
The report that Mr. Kennard makes is, that "the Stenay material leaves nothing to be desired and was highly approved by several makers to whom the bars were sent. The tin plates for stamping purposes



Plan.



Longitudinal Elevation.



Cross-Sectional Elevation.

OPEN SIDE PLANER, BUILT BY DETRICK & HARVEY, OF BALTIMORE, MD.

rarily deferred, to allow of the consummation of some matters still pending. From documents in our possession, however, we are enabled to convey some idea of the claims made for the new process, a study of which will be interesting, without any comment on our part. We quote as follows from the paper in question: This process secures great advantages in the cost of plant for producing the metal, in the very superior quality of that metal and in its cheapness. It is wonderfully perfect for steel castings, for rolling into bars or plates of any thickness, and the quality of all these is phenomenal in fluidity when poured, in ductility, in tensile strength, in elongation, in elasticity, in the ability to weld without flux, &c. This process

Paris and most successfully. The process is being secured by other French manufacturers and some of these have been and will be soon started. It is also in operation in Belgium, and works are being established in Italy by an Italian company, which has purchased the patent for that country. Lately the patents for Great Britain have been secured by one of the most eminent and distinguished manufacturers of Bessemer steel in that country, whose works produce about 2000 tons per week. This gentleman, Mr. H. J. Kennard, was president of the International Steel and Iron Association in Europe, and is chairman of the Steel and Iron Association for Great Britain. After visiting Stenay with his manager, and remaining three

made from the Stenay bars were equal to the best charcoal iron, if not superior." His converter has been put in operation in Wales with complete success as to its operation and product. Mr. Kennard remarked to a gentleman now in this country "that never was such magnificent steel made before; that for tubing, tin plates, wire, screws, bolts, &c.—in fact, for everything where perfect quality is required—this is the thing."

A converter has been started in Ohio and it has been operated in the presence of scores of practical men to their complete satisfaction. Samples of the product show wonderful qualities in physical and chemical tests. Many applications for licenses have been made, agreements for which have

been given in only three instances for special purposes or reasons, it not being fully settled as to the manner in which the business will be conducted for the entire country, hence delay till a policy is decided upon.

It may be reckoned that using a fair quality of pig metal, for in this system greater latitude in the quality of the metal employed can be enjoyed over the requirements of the Bessemer system, the cost of the steel or wrought iron in the ingots or in the molds will be at the present price of pig inside of \$20 per ton. The time needed to convert the molten metal into steel of any quality or wrought iron is seven to ten minutes. The cost to mold where castings are to be made may be reckoned on an average at 1½ cents per pound of steel used. No annealing is required. The cost to roll ingots into bars may be reckoned at ¼ cent per pound, and to put into plates for horse-nail and such like forms ½ cent per pound additional. Also the same to put into rods. The cost to roll ingots into boiler plate, including waste, may be reckoned at 1 cent per pound. Having made these statements on which to base an opinion as to a feasibility of a manufacturing industry being entered upon with profit, the following named products and the figures connected therewith will indicate the industries proposed and their practical working out as commercial transactions. Having in view an admirable works, well fitted in respect to buildings, power, machinery and appliances, with abundant space for extension, it is proposed to confine these calculations to products suited to the existing plant, and to such a variety, though few, as will, it is expected, insure a continuous demand for each. Also to a small volume of business in each, compared with what can be done as the developments of the business may progress.

Castings.—Product, 20 tons per day, or 6000 tons per year, would leave a net profit per ton of \$50. \$300,000
Horse-Nail Iron.—Say product one-third of the estimated amount used, which is 15,000 tons—viz., 5000 tons a net profit of, say, per ton \$20. 100,000
Norway and Swedish Shapes.—The consumption of these is considerably larger than that for horse-nail iron, but reckoning the product the same—viz., 5000 tons per year, giving a net profit of \$20 per ton. 100,000
Bar Steel and Wrought Iron.—As the rolling capacity of the works in view would easily produce 100 tons per day, and 35 tons are only reckoned on above, it is quite safe to reckon 50 tons per day for bar metal, or 15,000 tons per year, with, say, a net profit of \$5 per ton. 75,000

Total......\$575,000
Deductions.—Less royalty for castings, at \$7.50 per ton, 6000 tons.\$45,000
 Less royalty for 25,000 tons of ingots at \$1. 25,000
 Less salaries. 20,000
 Less extras of all kinds, say. 40,000
Total......\$130,000
Net profit per year \$445,000

To enter upon this manufacture would cost, if the works in view are taken, as follows:

Real estate, buildings, machinery, &c. \$75,000
 To put in order, say. 10,000
 To establish steel plant, say. 10,000
 To pay for molds, &c. 2,500
 To pay all extra costs. 7,000
Total......\$105,000

Accepting that the cash capital provided should be \$250,000, there would be remaining in the treasury in cash. 145,000

Total......\$250,000
 For outlays before any returns, say, for 52 days, 108 tons per day, 5356 tons pig iron at \$20 per ton, say. 107,000
 For coal same period. 13,000
 For labor same period and salaries. 25,000
Total......\$145,000

After two months, and undoubtedly before, receipts would begin to come in. In these calculations the figures are confined to comparatively small products and comparatively small profits. In the items of castings this could be very largely increased according to the space at command and the molders employed. The profit also could be very much larger. It will be noted that the price reckoned on is 5 cents per pound, leaving a profit of 2½ cents, or \$50 per ton. Ordinary malleable iron castings now sell for from 6 cents to 25 cents per pound, and these are most difficult to be obtained. In the items of horse-nail iron and Norway and Swedish shapes, about 2 cents per pound is reckoned on as the cost. The price at which these are now sold is, horse-nail iron 3½ cents to 5 cents per pound. The price of 3 cents is reckoned on, and it may be suggested that if a better article can be supplied at the same or slightly less price, a much greater quantity can be sold than one-third of the present estimated consumption, and at a better profit than reckoned on. Norway and Swedish shapes sell for from \$60 to \$70, and cost a little less than 2 cents, or \$40 per ton. The demand for these exceeds 15,000 tons per year. They or the material are wholly imported. As to the bar steel or wrought iron, the cost would vary according to the size of the bar. So would the selling price, and this metal being far superior to any bar metal known in commerce for a very great many purposes, will be preferred at the highest price of such metals. Fairly speaking, \$10 per ton should be reckoned on. As to the demand, that will be far greater than the amount estimated. There is a product which may be mentioned as the legitimate outcome of the starting of the works referred to, where there is abundant space, and to which the metal itself is admirably adapted. It is that of boiler plate. The softness and ductility of this product makes it especially valuable for that purpose. The demand is a large one, and the question of quality enters very largely into the price. There are very common grades which are sold for \$50 or \$60 per ton, but as by this only superior metal can be produced with a fair quality of pig metal, it could be safely reckoned that from \$75 to \$100 could be easily commanded. This would cost, reckoning largely for waste in the squaring and cutting of plates, about \$45 per ton.

An outlay for a first-class plate mill, including the steel plant, it is estimated, would be \$150,000. This would produce 100 tons per day of 24 hours; but, reckoning on 50 tons per day, and a margin of \$20 per ton, there would be an income from this source of \$300,000 per year. There is ample room for such a mill on the premises referred to. This branch of the manufacture could wait for the experience to be gained in the smaller branches which it is proposed to enter upon, or till the earnings supplied the needed capital for this enlargement.

In commencing this industry it is proper to remark that the tendency in mechanical work is to substitute, where it is possible, steel for iron, to secure by its use far greater strength and safety, to lessen the weight of railway carriages, vehicles of every kind, and of machines in general. All these are accomplished by the employment of this metal, and, in addition, for very many purposes, castings can now take the place of forgings, with their diminished cost.

The process does away with the puddling furnace, with its severe labor, its expensive repairs, and the delay of several hours to produce wrought iron, and accomplishes the making of a better product in from seven to ten minutes.

It will annihilate the annealing furnace, with its eight to fifteen days' loss of time, for castings made of this metal are ready

for the machine which is to finish them the moment they are cold.

These are some of the results of the utilization of air in the purification of iron, which was the splendid invention of Bessemer, but, unlike Bessemer, Roberts has found the way with about one-tenth of the air-pressure, and differently applied, to produce a metal which, in purity and fluidity, when poured, has never been approached commercially, and which, in strength and ductility, is phenomenal.

Railroad Rates and Trade Centers.

In deciding a recent case of alleged discrimination on coal traffic in Illinois, Interstate Commerce Commissioner Walker makes the following remarks on discrepancies between rates to trade centers and through them to points beyond: "Various considerations have heretofore entered into the making of through rates between railroads; when such rates involve a reduction from the sum obtained by adding together the local charges, carriers have not been inclined to make such contracts unless business reasons exist why the higher rate cannot be maintained. Another feature of the situation, which may properly be alluded to in this connection, is this: Upon other commodities Chicago merchants have been and are exceedingly jealous of through rates less than the added locals upon traffic between points east and west of that city, being apprehensive that any change in the existing system which shall encourage the movement of traffic through or around that city, without stopping there for redistribution, will work to their serious injury. Chicago traders would regard the general establishment of such through rates as are here claimed as a commercial calamity; yet, if conceded by the roads to Eastern coal, similar proportionate divisions might possibly be claimed upon eastern shipments of dry goods, groceries and other commodities. Such through rates were common upon long-distance traffic in many parts of the country before the passage of the act to regulate commerce, and the commission has held, in the Danville and Omaha cases, that the law did not make them illegal; but it is for the interest of Chicago as a distributing point that their adoption upon traffic passing through that city should not be pressed. And the roads themselves have been more than willing to preserve the system of generally routing freight to Chicago, and thence again forward to its destination in both directions, practically making a break in the billing at the line of Chicago and the junction points in its vicinity; this system enables the lines each side of the division to escape from rate wars and other complications which from time to time arise among the roads on either side of Chicago; and it also makes it possible for the lines on both sides of that city to secure better revenues from the business which they respectively handle."

Mr. J. H. Bartlett, of Montreal, well known in connection with the Canadian iron trade, has been at Pictou (N. S.) in the interest of the Pictou Coal and Iron Company, of Montreal, and has obtained from the County Council a cash subsidy of \$20,000, as well as remission of all taxes for 20 years. Mr. Bartlett has made a contract with R. G. Reid, of Montreal, for the construction of a branch railway, 10 miles long, leading to the iron mines, and the Dominion Government have arranged to operate the branch as a part of the Intercolonial and provide all the rolling stock. It is estimated that iron ore can be easily and cheaply mined from the Pictou Coal and Iron Company's mines, which are only 7 miles from the Pictou coal mines and 10

miles from Atlantic tidewater. The location of the blast furnaces has not yet been definitely settled.

Valves of the Wheelock Engine.

The valve used in the Wheelock is a multi-ported slide working on a flat seat formed within a skeleton plug or shell,

rocking spindle having bearings in the ends of the shells. Motion is communicated from the spindle to the valve by a toggle joint, which is clearly shown in Fig. 3. Upon the outer ends of the spindles are keyed cranks driven direct from the eccentric in case of the exhaust-valves, the admission valves being operated from the others by latch links, which

required to raise it decreases, until the full opening is reached. The valve shells being simply driven into place in the cylinder, have no joints to pack, and, furthermore, they can be instantly removed by simply driving them out. A duplicate set of valves may, if considered necessary, be kept on hand to be used at a moment's notice if required. This valve insures

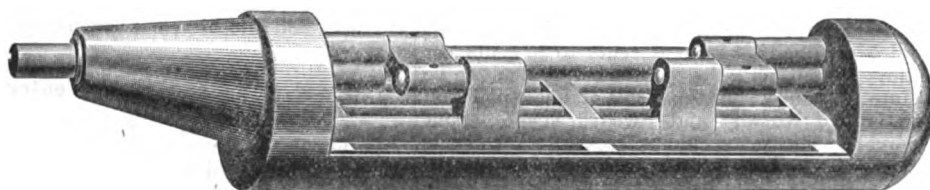


Fig. 1.—Valve Open.

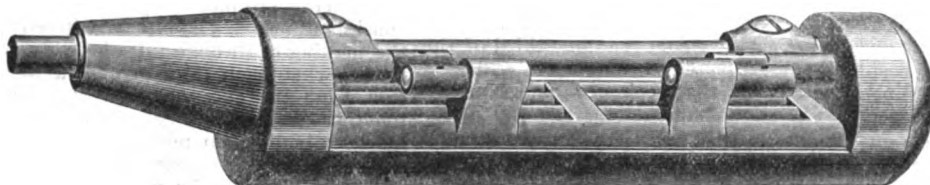
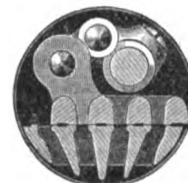


Fig. 2.—Valve Closed.



Section.



Section.

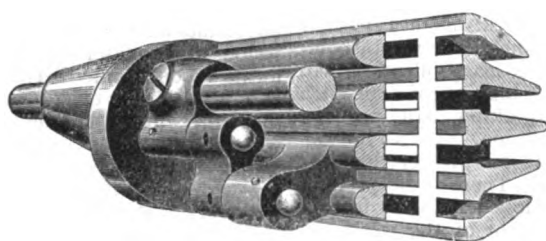


Fig. 3.—Perspective.

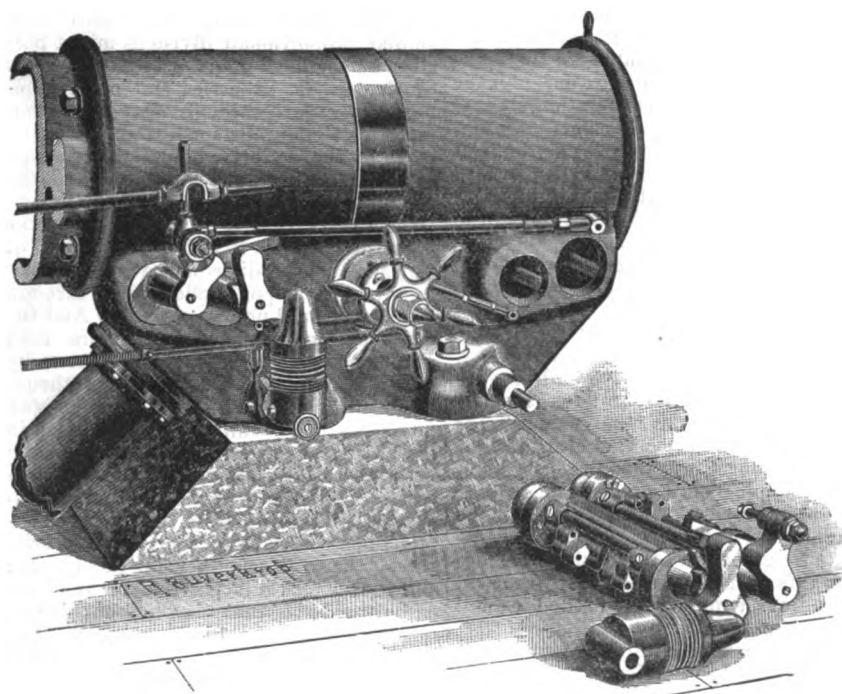


Fig. 4.—Steam Chest.

VALVES OF THE WHEELOCK ENGINE, BUILT BY THE WHEELOCK ENGINE CO., OF WORCESTER, MASS.

through which are cored passages forming the ports, as shown in the sections of Figs. 1 and 2 and in the perspective, Fig. 3. The valve and operating parts are mounted upon this shell. The shell is turned slightly tapering to fit corresponding holes in the steam-chest (Fig. 4), and is ground to a steam-tight fit, so that when lightly driven into place it will be securely held without the need of other means of fastening than that afforded by the tapered driven fit. The valve is operated from a

alternately hook on and let go through the action of a curved finger engaging with trip cams adjusted by the governor, thus accomplishing cut-off in an obvious manner. Several advantages are apparent from this method of operating the valve. At the first part of the throw of the valve, when it is heated by the full steam pressure, the movement is comparatively slow, and the maximum power of the toggle joint is brought into play. As the valve moves its speed increases, and the power

small clearance and large port areas with correspondingly large pipes and directness of steam passages. It is claimed that this system will admit of a port area one-fifth of the piston area, and yet have less clearance, less valve travel and friction, and an easier running-valve system than any other. The toggle movement permits proper timing of the movement without extra travel and lap, and gives the shortest possible travel. It also gives the power of the toggle, as before stated.

The engines fitted with these valves are built by the Wheelock Engine Company, of Worcester, Mass.

The Dominion Canals.—Statistics of traffic on the Dominion canals during the year 1888, as prepared by the Minister of Inland Revenue, show a slight decline in the volume of business as compared with the previous year. The total freight transported was 2,452,063 tons, against 2,470,744 tons in 1887, and vessel tonnage 3,433,242 tons, against 3,461,330 tons. Of the total tonnage passing through the Dominion canals during the year 2,823,202 tons was of Canadian and 610,040 tons, or 17.7 per cent., was of American register. Of the total tonnage passing through the Welland Canal American registered vessels represented 39.3 per cent. The total freight tonnage moved on the Welland Canal last year was 809,291 tons, of which 16 tons was farm stock, 119,354 tons the products of the forest, 24,423 tons of manufactured goods, 245,686 tons of merchandise, and 419,812 tons vegetable food and other agricultural products. Freight tonnages over the St. Lawrence canals amounted to 570,323 tons, of which 1091 tons was farm stock, 151,194 tons forest products, 64,825 tons manufactures, 219,760 tons merchandise, and 133,453 tons of vegetable food and agricultural products.

A Stockholm correspondent of the *Vossische Zeitung* states that a meeting has recently been held at Oerebro, at which there were present representatives of most of the iron works of Central Sweden, representing collectively a production of about 200,000 tons annually. After a short discussion it was agreed to form a syndicate for the regulation of the prices of iron, and another meeting will be held at which to arrange the details. In the meantime efforts are being made to include in the agreement those works which were not represented at the first meeting.

The Miller Duplex Pump.

In this pump the piston rods are made in two parts and connected at the cross-heads, thereby permitting the removal of either the steam piston or the water-plunger without in any way interfering with the other parts. The piston rods on the steam end are of cold rolled steel, while those on the water end are of non-corrosive composition metal; the cylinders on the water end are also of composition metal. The crossheads which drive the levers can be quickly removed if necessary. The bearings of the latter are chilled and case-hardened, and all wear can be taken up centrally while the pump is running. As the position of the levers is not changed by adjusting, the stroke always remains the same. The cylinders on the water end can be quickly removed and replaced, thus facilitating repairs and reducing the cost of the same. By a convenient arrangement, the packing in the water cylinder can be adjusted to wear, or the plunger repacked without trouble. The valves on the water end can be easily and quickly removed when found desirable while the pump is in motion, as can also the valve seats without disturbing the other parts. These pumps are particularly designed for boiler feeding, brewing, mining and fire purposes. They are manufactured by the Canton Steam Pump Company, of Canton, Ohio.

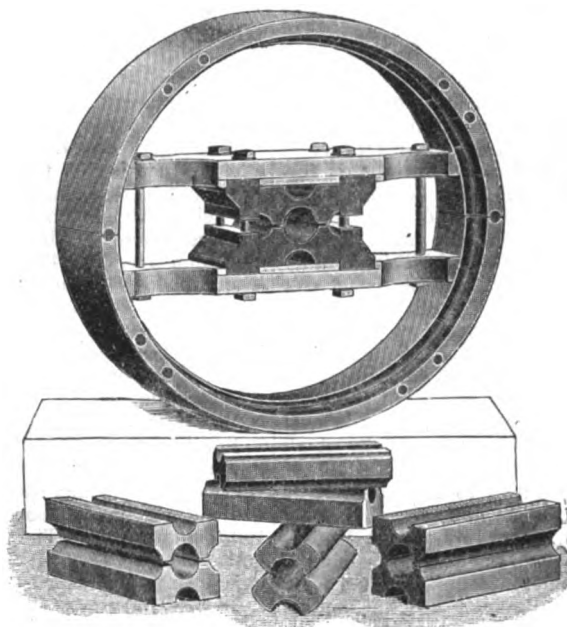
The Duty on Crop Ends.—The Supreme Court of the United States has delivered an opinion in the case of William H. Robertson, Collector of the Port of New York, plaintiff in error, against the executors of Charles L. Perkins, in error to the Circuit Court for the

claimed that the crop ends were dutiable at 20 per cent. as "unwrought metal." The court below gave judgment for the importer on the ground that the crop ends were a mere excess of material

left over after the making of steel rails, and that as they were not fit for use in their present form they were properly dutiable as "unwrought metal." This court reverses that decision and sustains the action

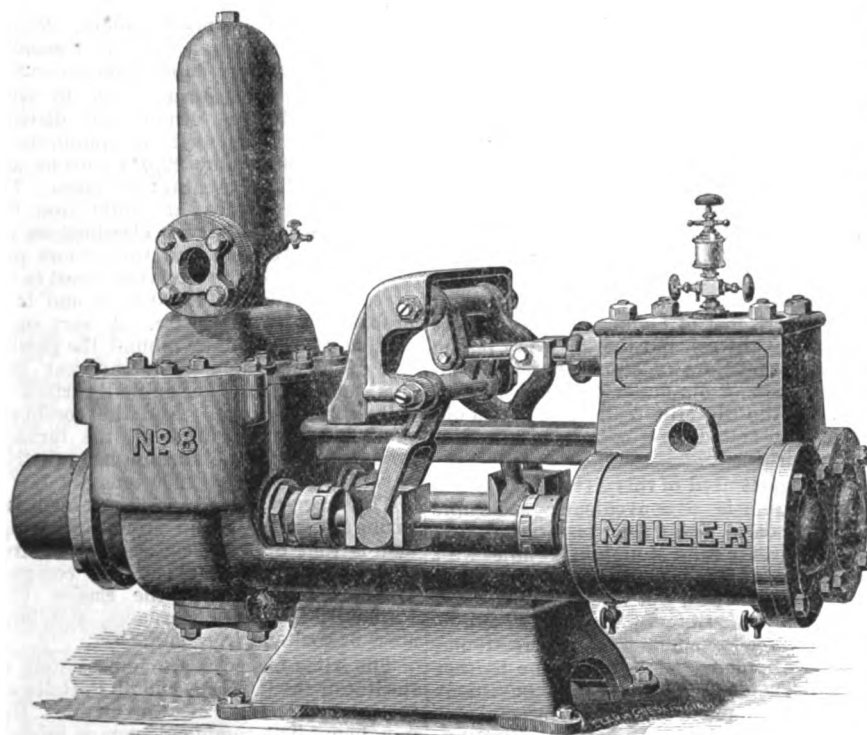
Separable Wood Pulley.

In these pulleys the rim is built up of a series of rings of wood. The line of separation is between the arms, and the



SEPARABLE WOOD PULLEY, MADE BY THE TAPER SLEEVE PULLEY WORKS, OF ERIE, PA.

center of the pulley is at the middle of this line, at which point a square orifice is made by the mortising of two blocks in each arm. Into this orifice are fitted the bushings, the form of which is clearly shown in the lower part of the engraving. Each bushing consists of two parts, each of which has a semi-circular groove cut into it, so that when the two parts are adjusted in place between the arms of the pulley a circular hole will be formed to receive the line shaft. By setting down on the bolts the arms are brought together, the bushings are forced against the shaft and the pulley held fast. By loosening the bolts the pulleys may be moved along the shaft and secured at any point. By reversing the half-bushings—face for face—the pulley may be fitted to a shaft of different diameter, and by ordering bushings to suit the pulley may be fitted to any desired size of shaft. These pulleys are made by the Taper Sleeve Pulley Works, of Erie, Pa., with two or four arms (the latter in sizes above 48 inches) or with solid webs.



MILLER DUPLEX PUMP, BUILT BY THE CANTON STEAM PUMP CO., CANTON, OHIO.

Southern District of New York. This is a customs suit brought to determine the rate of duty on crop end of Bessemer steel rails. The collector assessed a duty of 45 per cent. on the importation under the tariff provision for steel not specifically enumerated or provided for. The importer

of the Collector. In an opinion by Judge Blatchford the court holds that Bessemer steel rail crop ends are none the less steel because they are an excess of material and not fit for use without being remelted or reheated, and that, therefore, they are dutiable as "steel not especially enumerated."

Pickands, Brown & Co., 117 Dearborn street, Chicago, are distributing a dainty little pamphlet calling attention to the "progress made in producing in the United States a pig iron in every respect equal to the imported Scotch." In confirmation of the statement just quoted, they give comparative analyses, as follows, of some well-known brands of imported Scotch, and the No. 1 Dexter sold by them and made by the Ohio Iron and Steel Company:

	Colt- ness.	Glengar- nock.	No. 1 Dexter.
Metallic iron.....	90.26	90.70	91.52
Silicon.....	3.39	2.83	3.13
Manganese.....	1.77	2.13	1.41
Graphitic carbon....	3.27	2.69	3.34
Combined carbon....	0.60	0.85	0.06
Phosphorus.....	0.44	0.54	0.46
Sulphur.....	0.04	0.04	0.02

The Queen and Crescent route announces a reduction of 15 cents on pig iron rates, as effective since December 1 in accordance with Tariff No. 10.

Collieries and Iron Mines Between Chattanooga and Birmingham.

Passing Chattanooga the first iron ore that is to be found is in thin runs near Wauhatchie, and for a considerable distance it is not workable. At Rising Fawn the ore is worked for use in the furnaces. There it is poor in iron and rich in lime. It is mixed with brown hematite and makes an excellent iron. After a series of years of bad management and failures, this furnace, under Mr. Collier, has been made one of the most successful and profitable in the South. It is about one mile from the main line and connected with it by a standard gauge railroad. The stack is 63 feet high with 16-foot bosh, and is equipped with 5 Whitwell fire-brick stoves. The coke used is brought from Dade mines on the Nashville, Chattanooga and St. Louis Railroad. Mines were opened on the company's land many years ago, but the coal was too full of slate to make a coke at all fit for use.

From Rising Fawn to Attala no large mining operations are now carried on. At several points the coal in Lookout Mountain has been opened, but after a few months of work abandoned. It is contended by many that there is good coal in this mountain and it is at least possible that such may be the case. One thing is certain, that no properly organized company with ample capital has ever explored or operated in this field. Near Gadsden a small seam of good coal is worked for local use.

Near Reese's Station, on the railway, the Etowah Mining Company have opened the iron ore and have just commenced shipping. The company own $3\frac{1}{2}$ miles on the vein and have a contract with the new Collier Furnace at Attala to supply 100,000 tons of ore.

The Rome and Decatur Railroad, which is not likely to go beyond Attala for many years, will eventually be a great thoroughfare for the transportation of iron ore, and a valuable feeder to the Cincinnati, New Orleans and Texas Pacific Railway. On its line is the famous Dirtseller Mountain, the ore of which is said to be of quality superior to any red fossil ore in the South.

Gadsden, six miles from the line of railway, is a thriving place. It has now two iron furnaces, with good prospect of a third. One is run with charcoal and owned by Cranford & Sons, of New Castle, Pa. The wood is chiefly brought to the furnace, and the charcoal made there in kilns. It will eventually be turned into a coke furnace.

The Gadsden and Alabama Furnace Company have only lately commenced operations, with Ellis Collier as the directing head and John Dowling as furnaceman. The furnace is calculated for 100 tons per day, and has Whitwell fire-brick stoves. The ore used is obtained from Attala and in the immediate neighborhood, and coke from Pratt Mines, at Birmingham.

The Attala Steel and Iron Company is the title of an operation commenced about one mile from Attala Station, at which place a stack 50 feet high, with 12-foot bosh, has been erected. It is intended, at least for a time, to use charcoal as fuel. It is expected that all will be ready to go in blast April 1, 1889.

As a feeder to the Cincinnati, New Orleans and Texas Pacific Railroad, likely to forward much freight and also give access to an important region of country, the lately completed railroad called Anniston and Cincinnati, from Anniston to Attala, is a connection of great possible value to the Cincinnati, New Orleans and Texas Pacific, and its managers will not be slow to appreciate the advantages thus offered them. Connecting with this railway to Attala, its other terminus at present, is the thriving

city of Anniston, where there are now four iron furnaces and many other manufacturing establishments. It is proposed to extend it to Montgomery, and thus the Cincinnati, New Orleans and Texas Pacific will reach that field of traffic.

The great mining operations around Attala and Gadsden are conducted by Messrs. Stewart & Hammonds, who operate two mines near Attala and one or more in the iron ridge northeast of Gadsden. At their No. 1 mine, near Attala, they work 100 miners and 25 outside men, and the average product is 200 tons per day. They have control of a length of 4 miles on the ore vein, which is from 2 to 4 feet thick. The ore is here in hills, the long, flat top of which averages 400 feet above water level; the lowest place they are working is 200 feet above water level. An incline drops the ore cars to a branch line, which reaches the main line of railway in 450 yards. The ore dips at an angle of 28° . The product could be doubled if cars could be had.

No. 2 mine is $1\frac{1}{4}$ miles from the main line in a similar hill, the thickness of the vein being the same; the number of miners and outside hands about 65, the product 100 tons per day. The ore is sent from both mines to Dayton, Chattanooga, Rising Fawn and Gadsden.

Stewart & Christopher also mine in the ridge at the southeastern foot of Lookout Mountain. They employ here about 100 miners, and get out 200 tons of ore per day, which is sent to the Gadsden furnaces. A standard gauge track runs immediately at the foot of the mountain, and the ore is dumped directly into the wide gauge cars from the mine mouth. They have a lease of 4 miles of this ore. The dip is vertical at the top, but begins to flatten slightly at a depth of 150 feet. The Rome and Decatur road skirts the foot of this ridge for 20 miles.

It is seen from these statements that the amount of ore in the vicinity of Gadsden and Attala is large. It is probable that Stewart & Co. have taken from their mines 600,000 tons of ore, and, as is stated, they are still 200 feet above water level. The supply is not confined to that at Attala, Gadsden and up the Rome and Decatur Railroad. The ore mentioned is all in what is called Big Mills Valley. Parallel to this is Little Mills Valley, and in it is also a long line of ore, and it is only 4 miles distant from the railway line. Further, the Attala ore dips to the southeast; that at the eastern foot of Lookout Mountain dips to the northwest, and there is every reason to infer that the two seams are one, forming a basin of ore under Lookout Mountain and the Big Mills Valley. This should be demonstrated by a boring with a diamond drill.

The great need of this Attala and Gadsden region is a conveniently accessible coking coal. The writer is satisfied that such exists in Sand Mountain, 10 miles west of Attala, on the surveyed line of the Rome and Decatur road, but whether it will ever be made accessible by that line is doubtful. The large amount of iron ore around these two places and on the line to that coal demands that a cheap and convenient fuel be obtained. The low-priced ores cannot last forever, and going to Birmingham for Pratt Mines coke, with equally as good or better so near, is an absurdity which should be remedied as soon as possible. Attala and Gadsden will never be what they should be until they have accessible and cheap coke of their own.

The great lead of iron ore continues parallel with the railway from Attala to Springville, but is not now worked at any point. Hugh Carlisle formerly carried on large operations near Springville, but while the ore is abundant, of good quality and with system can be cheaply mined, yet no work is now done there.

At Trussville a furnace has been erected about $\frac{1}{4}$ mile from the railway line. It uses ore from Murphrees Valley and coke made from coal from the Little Warrior field.

The Little Warrior coal field alluded to is an area of country which has not received the attention it deserves. It contains a number of valuable coal seams, among them one which will make good coke. It is accessible to the C., N. O. and T. P. above and near Springville.

This coal field is on the west of the railway, on the east from near Springville by Trussville to Red Mountain Gap; the Cahaba coal field is within a few miles of the railway line on the east side. There are several streams down which branch roads could be built reaching into it, especially down Little Cahaba from Trussville, where good coal can be reached in 3 miles' distance.

In Red Mountain, from 1 to 2 miles off the railway line, are several mines, which belong to and are operated by furnace companies in Birmingham. A considerable traffic is done in shipping sand, from the decomposed white sandstone in Red Mountain, to the furnaces in Birmingham. Large quantities of limestone are also shipped from quarries near Trussville.

Birmingham, the great center of the coke-made pig iron of Alabama, was directly created by the avarice of certain landowners in Elyton, when the Alabama Great Southern was built. The depot of that road was located in the old sedge-field, which is now the site of elegant residences and of large business houses, because Elyton people asked an exorbitant price for their land. The depot located, the South and North Railroad came to the same place, and from that time Elyton was doomed and Birmingham was to be. In 1869 the writer slept on the site of the magnificent Union Depot in a rough board shanty 10x12 in size. It was then the only house for miles around. No one can now visit the place without wondering at its rapid and substantial growth.

In and around Birmingham, in what might be called the Birmingham district, are mines, manufactories and public institutions which employ 22,011 persons and pay out \$834,241 monthly as wages. Immediately in the city are eight iron furnaces, and in the region classified as the district are 12 more and three more projected. In 1870 the total coal mined in the State was stated at 11,000 tons, and it is probably an over-estimate. A very small part of it was mined around the present site of Birmingham. For the year 1888 this amount has undoubtedly risen to fully 2,225,000 tons. And the combined product of pig iron from all the furnaces now running in the Birmingham district is very near or quite 1600 tons per day.

The largest mining and iron-manufacturing operation in and around Birmingham is that of the Tennessee Coal, Iron and Railway Company. This company own the Pratt Mines, the Ensley City Furnaces, the Alice Furnaces, and large areas of coal and iron land.

The Alice furnaces are immediately on the line of the C., N. O. and T. P. Railway, just on the edge of the city of Birmingham. The combined average product of these two furnaces is about 180 tons per day.

The largest furnace operation around Birmingham, and in fact in the South, is the Ensley furnace plant, owned by the Tennessee Coal, Iron and Railway Company. These furnaces are about 17 miles from Birmingham, on a branch of the C., N. O. and T. P. Railway. The plant is designed for four stacks, each 80 feet high by 20 feet bosh, but only three of them are finished. The three which are in full working order make an average of 125 tons of iron per day, using five-eighths

hard ore and three-eighths soft. The average analyses are:

	Hard ore.	Soft ore.
Metallic iron.....	38.78	48.87
Silica.....	11.60	21.48
Carbonate of lime.....	29.29	.....

The furnaces are equipped with 12 Weimer blast engines, with air cylinders 84 inches diameter by 54 inches stroke, and the steam is furnished by 64 boilers, 84 feet long by 48 inches diameter, with two flues. The stack house is 700 feet long by 100 feet wide, in which are two lines of trestles. The cast houses are 175 x 60. Each stack has four Gordon fire-brick stoves, 65 feet high by 21 feet diameter, and the air is heated to 1500°.

Ground was broken for the foundation of these furnaces November 12, 1886, and the first one was blown in and made first cast April 10, 1888. The second was blown in June 4, 1888. Ores from Red Mountain are used solely. The coke is from Pratt Mines. About 600 hands are employed about the furnaces, and the whole construction and operation has been,

to 225 tons per day. It is an excellently located plant.

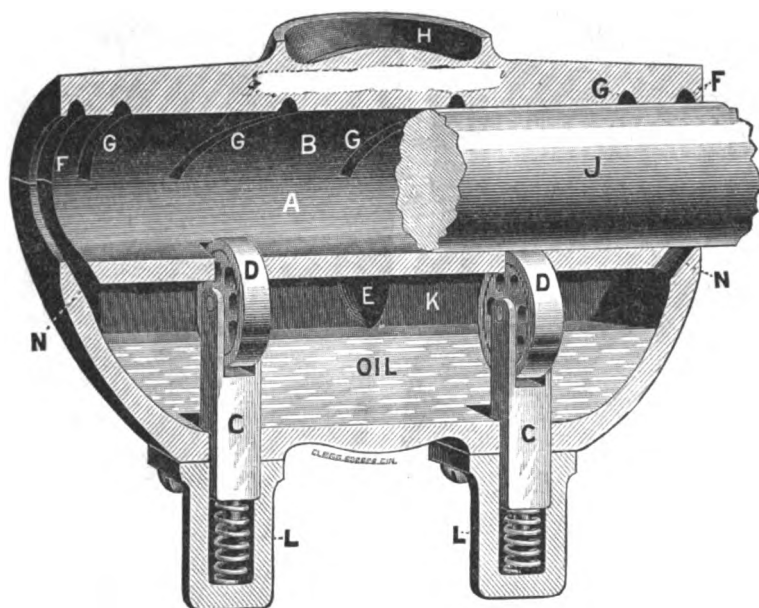
The Morris and other mines in Red Mountain are on the east side of the railway and are connected with it by branch roads. The Morris Mining Company is the largest iron mining operation in the South, their daily shipments averaging about 1200 tons, about half of which goes over the C., N. O. and T. P. Railway. There are four slopes and drifts and considerable surface stripping is still done. About 400 men are employed at all the works. The iron is full 21 feet thick and dips to the Southwest at an angle of about 28°. The surface or outcrop ore is stripped of the overlying slates and shales to a depth of about 18 to 20 feet; from thence slopes have been driven down. On these outcrop strippings all the ore is taken out and it is gotten at a very low cost, while in the slopes seldom over one-third can be taken out from the impossibility of holding up the roof. At No. 1 mine an air compressor has been erected and drives a number of drills. A wide-gauge road connects to

The Cahaba Coal and Coke Company's mines at Blocton, nine miles from Woodstock Station, on the main line of the C., N. O. and T. P. Railway, is the second largest coal mining operation in Alabama, and bids fair to come up to or even exceed the output of the Pratt Mines. These mines are connected to the main line by a wide gauge track, well constructed and laid with heavy steel rails. The mines are operated in two different coal seams, in which there are six slopes. No. 1, the lower seam, makes the best coke, and good steam or domestic coal is taken from No. 2 seam. About 1000 hands are employed by the company. Over 300 coke ovens are now used, and more will be erected, as the two coke furnaces at Anniston are to be supplied from these mines. The coke shipments now average 200 tons per day, and the coal over 2000 tons. Of the latter, 300 tons per day go to the Southern Pacific Railroad in Texas, and the coal for making coke is also supplied to the Thomas Furnace Company. The whole operation is under the management of Col. C. Cadle. The capital invested is almost entirely Northern.

At Woodstock Station is the stack of the Edwards Iron Company, now out of blast. It will be remodeled and modernized. About 2 miles distant a considerable operation is carried on in mining brown hematite iron ore, which is shipped to the furnace at Bessemer.

There is a valuable area of coal land south of Woodstock which was once operated extensively, but was abandoned. The seam to be worked was not judiciously selected. This area centers at Dudley Station, and it contains some very valuable seams of coal. The iron ore is in this region found some distance to the east of the line of railway.

This completes the industrial development and mining operations now existing on the line of the Cincinnati, New Orleans and Texas Pacific Railway. Within the limits which have been traversed from the Cumberland River to the Tombigbee are many opportunities for investments which will yield a good profit from rise in value, and also many localities where operations in mining and manufacturing can be conducted with a return for labor and capital expended.



JOURNAL BOX LUBRICATOR, MADE BY THE INDUSTRIAL MACHINE TOOL WORKS, CINCINNATI, OHIO.

and is, under the superintendence of Mr. Harry Hargraves, a well-known furnace manager.

The Pratt Mines, near by the furnaces, now have an output of 3600 tons per day, which is shipped off, in addition to which there is 600 to 700 tons of slack which is made into coke at the mines; 1000 convicts and from 1600 to 1700 free men are employed. There are 1000 coke ovens and more are being built. Coal is furnished to the Sloss and Alice furnaces, which make their own coke, and coke is furnished to the Mary Pratt Furnace, and to the coke furnace at Gadsden.

On the branch of the C., N. O. and T. P. Railway going to Ensley is the Thomas Furnace, called the Pioneer Coal and Iron Company. The stack is 75 feet high with 17-foot bosh and averages 100 tons per day of pig iron. The houses for hands erected by this company are of brick and present a very neat and substantial appearance. This furnace uses one-half Red Mountain red fossil ore and one-half Green Pond brown hematite, and coke from Blocton mines.

The Woodward Furnaces are 10 miles below Birmingham on a branch of the C., N. O. and T. P. Railway, about 1½ miles from the main line. There are about 300 men employed by this company around their furnaces, coal mines and coke ovens, and the pig iron product ranges from 200

Hillman Station on the C., N. O. and T. P. Railway.

J. R. & C. J. Smith operate a mine on land belonging to the Tennessee Coal, Iron and Railroad Company, the product of which all goes to the Ensley furnaces.

The Woodward Iron Company also operate mines for their furnaces, employing about 130 men and getting out about 500 tons per day. The Sloss Iron and Steel Company also get out ore for their furnaces from ore land which they own. Their output is about 600 tons per day, and about 200 men are employed.

A few months ago Bessemer was in the woods; now there are large business houses, two large iron furnaces and three more projected, a fire-brick works and a rolling mill. It may be said to be a creation of the magic hand of H. F. De Bardeleben. The furnaces are located near the railroad. The plant consists of two stacks, 75 by 17, equipped with three Whitwell stoves. The coke is made in ovens at the furnace from coal mined at the Blue Creek Mines, which are in a detached part of the Marion coal field called the Little Basin. The coal is of excellent quality, but the vein pitches steeply. Five slopes have been opened, and while the present output is only 700 tons per day, it is evident that very soon the capacity of the mines will largely exceed that amount.

Journal Box Lubricator.

A new form of self-oiling journal box is being introduced by Mr. Walter L. Haldy, proprietor of the Industrial Machine Tool Works, Cincinnati, Ohio. In the lower part of the box are placed the plungers C which move in the cylinders L and are held against the shaft by coiled springs. The wheels D revolve with the shaft, in the engraving the right-hand one being in action while the other is idle. The wheels, when revolving, carry the oil from the reservoir to the shaft. In the cut F represents grooves in the upper and lower boxes provided to convey the surplus oil back to the tank after it has been used. In the upper cap are grooves G by means of which the oil is distributed. The patentee of this device states that this box will lubricate perfectly with any kind of oil or grease, using the same over and over. In places where the oil is apt to become stiff or frozen, the turning wheels will, after a few revolutions, carry the oil with them.

The National District Assembly of Machinery Constructors, Molders, Pattern-makers and Boiler-makers has decided to withdraw from the Knights of Labor. The assembly had 20,000 members 18 months ago, but since then it has been steadily on the decline until not more than 8000 members are now in the organization. It is the intention of the members to form what will be known as the Independent Order

of Machinery Constructors of the United States. The order will be attached to the American Federation of Labor, but will be independent in the control of the affairs of its own members. They favor the eight-hour movement of the American Federation of Labor in May, 1889.

Hunt's Rail Specifications.

CAPTAIN HUNT'S REPLY.

To the Editor: Permit me to thank you most heartily for the interest you have shown in the matter of rail specifications. Notwithstanding the kind terms with which you refer to me, I feel that your appreciation of the importance of the sub-

among my old friends and former *confrères*, the manufacturers, *seriatim*, and while so doing I am relieved of all embarrassment by being in absolute ignorance as to the individuality of any of them.

Naturally I cannot take any exceptions to the first gentleman's remarks.

To the second I would say that, as stated in my paper supplementary of my specifications, the proposed system of test pieces is one which I had successfully used at Troy for many years, not only in making rail steel, but with various other kinds, ranging from 0.05 to 1.0 per cent. of carbon. I fully appreciate the effect on these test bars of different modes of treatment, and also the results obtained by greater or less work; hence I provide that: "These test ingots shall be 3 x 4 inches, and not less than 4 inches long. From these bars at least $\frac{1}{4}$ inch square shall be drawn at

only adopt it as a safeguard against steel so hard as to be dangerous. In defence of Section 10, I respectfully submit the following photographs (see plate), taken of ingots which had been kept in an upright position until the interior steel had solidified, and of others which had been placed on their sides as soon as possible after casting. For these I am indebted to Mr. Robert Forsyth, general manager Union Steel Company, Chicago. He had two ingots from several heats treated in these two ways. These ingots stood next each other in the pit, and had been cast under as nearly the same conditions as possible. When cold they were broken under a drop. Of course had they been cut in two a better exhibit would have been made; but they tell the story as they are, and cutting would have been much more expensive.



FRACTURE OF STEEL-RAIL INGOT.

ject rather than any merit of mine has induced you to devote so much time and space to the subject. In preparing my specifications I realized that I would not present any new or startling theories or discoveries. I did not attempt it. It happens that I have devoted many years to the manufacture of iron and steel, and that steel rails have formed a large percentage of such product. I have made some very good rails, and some of which I was not so proud. Naturally I have given considerable thought to the causes which produced the different results. I know that the rails of the present are not giving as good service as many which were made some years ago. I believe by following the rules which I have presented under the head of my "specifications" many of the failures can be avoided. And this can be accomplished without necessitating the alteration of existing plants or materially increasing the cost of manufacture. Each section is based on ascertained facts, proven by practice. There is not an unsustained theory in the whole 21 sections.

With your permission I will now reply to your various correspondents from

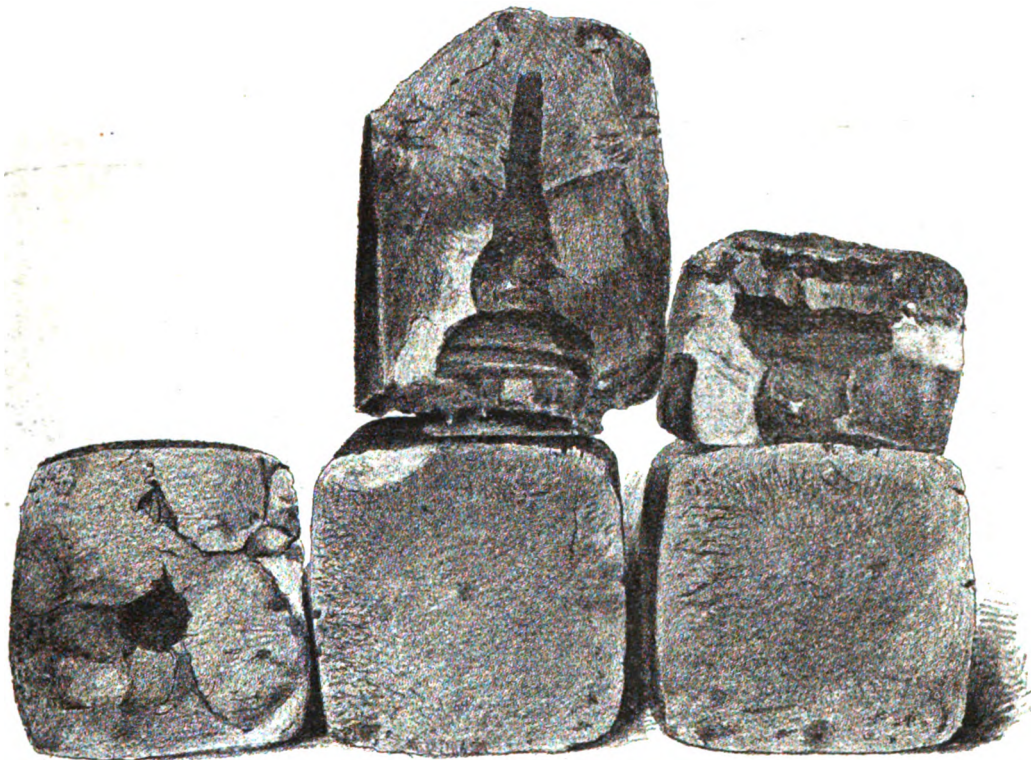
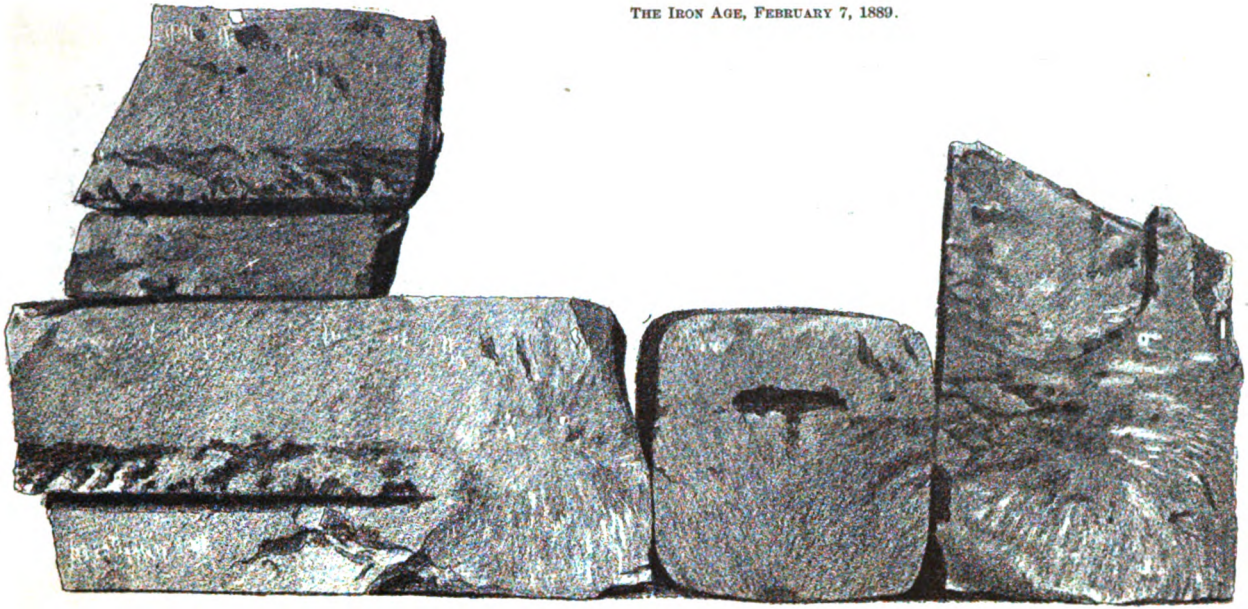
one heat by hammering." I provide that tests shall be made from ingots representing different parts of each heat, so as to detect any irregularity in the steel, should it exist. I do not propose that these bars shall be prepared by anybody, but assume the mills, for their own protection, will detail suitable men.

I prefer this plan to drop tests made of rail ends because I believe it to give equally accurate results and to have the advantage of checking the work before the steel is in a finished rail. To use the drop test under the system pursued at several of the American mills would seriously interfere with their present system. At these the rails are loaded on the shipping-cars as fast as they leave the drills, both day and night. It will be easily seen that if they were to be held until rail ends from the first and last ingots had become cold enough to test under the drop serious interruption would occur. Then, again, neither railroad engineers nor rail makers are perfectly in accord as to which drop test is the proper one.

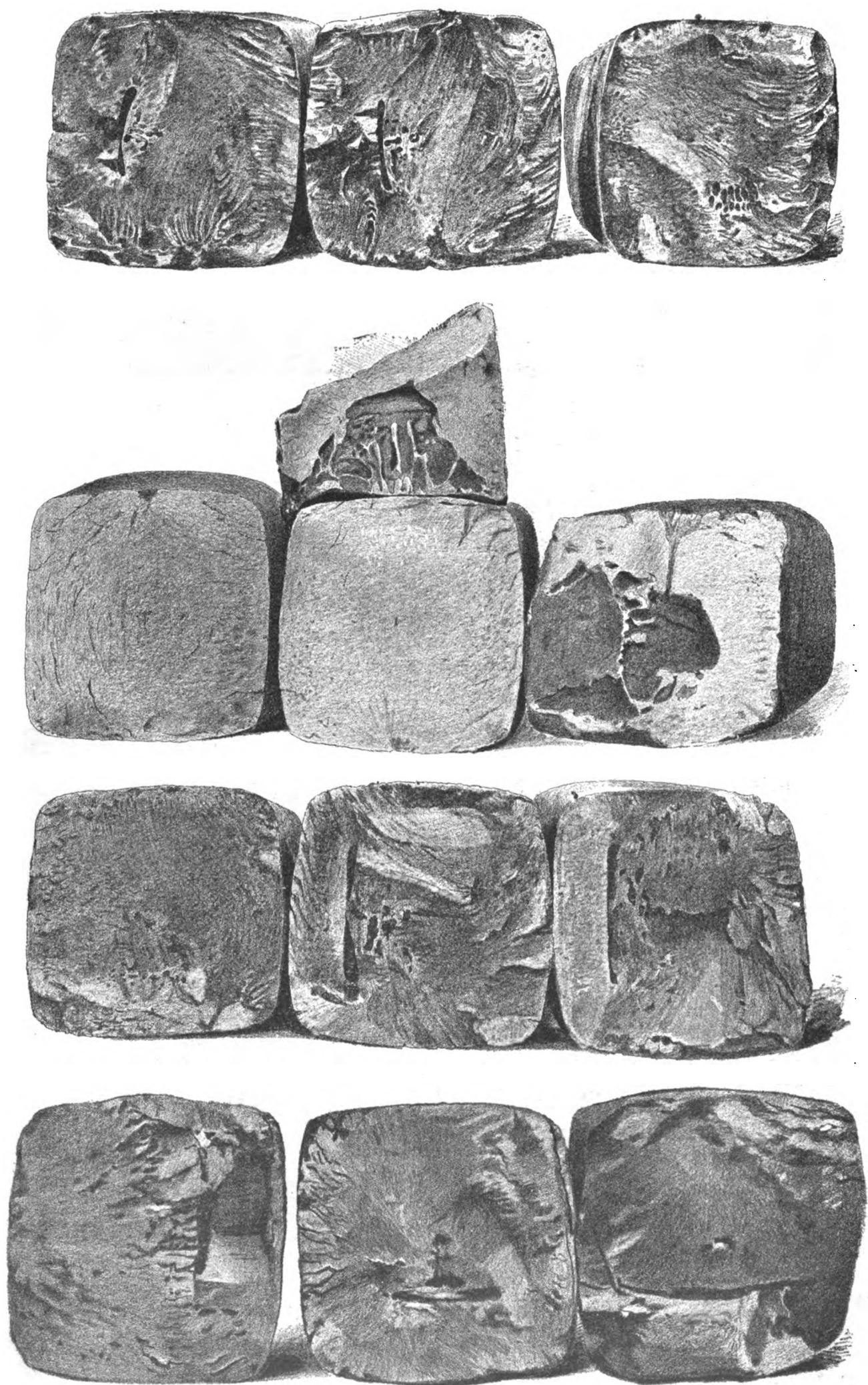
I do not offer my test bar as a means of determining the "wearing qualities." I

It is true Mr. Forsyth was fully convinced of the error of too hurriedly placing ingots on their sides, and no doubt these specimens may be exaggerated examples. Granting this to be true, they nevertheless show what can happen and a danger to be carefully avoided.

To prove that such things do happen in actual practice, I submit the section of a rail which broke in the track, Fig. 6. The ingot from which this was made had most evidently been too quickly removed from a vertical position. Railroad men have seen hundreds of such rails. They may not have actually broken in service, but have failed by crushing. A few months since I happened to be in one of the yards of the St. Paul, Minneapolis and Manitoba Railroad, near St. Paul, when they were putting in a siding, and were using for the purpose old rails which had failed in service, by cutting from them whatever lengths of sound steel were possible. Among some 50 rails so treated I saw at least six showing such cold sheets. Some of them did not come so near the surface as the one illustrated, because the chilled wall of the ingot had been thicker. In



FRACTURES OF STEEL RAIL INGOTS THROWN ON SIDE BEFORE COOLING.



FRACTURES OF STEEL RAIL INGOTS THROWN ON SIDE BEFORE COOLING.

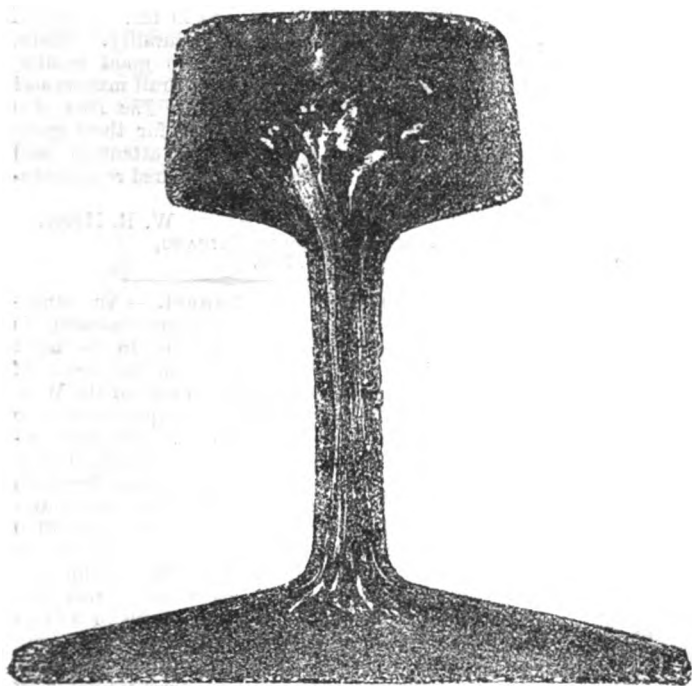
other words, the ingot had not been disturbed so soon after casting. These are what may be called the worse cases. The following etchings of rails, some of which had been in service, others fresh, from the

seen service, but is nearly sound, and was rolled at another American works.

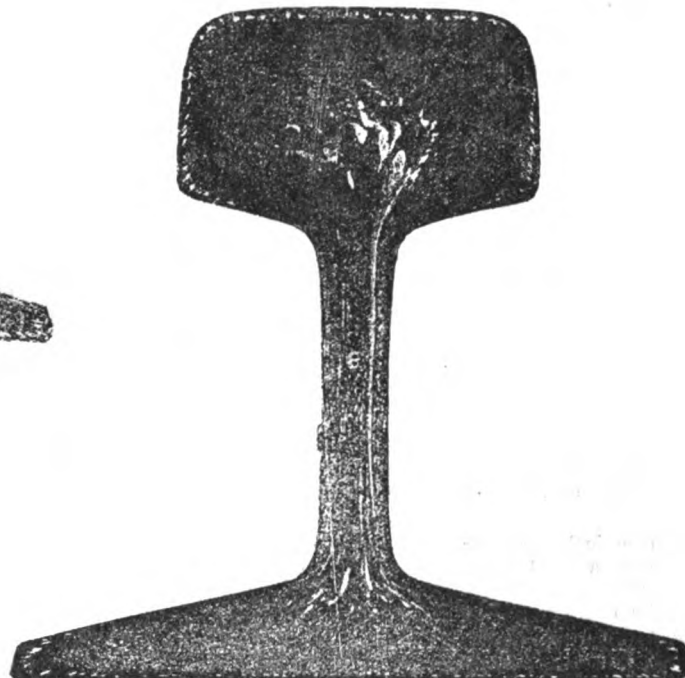
My third critic sets me a greater task, and I can best answer him by referring to my paper, explanatory of and preceding

the rail company which produced in 1887 the largest tonnage of any of the American mills. In this connection let me remind my friend that my specifications do not provide any chemical composition. On the contrary, in view of the test bars and the guarantee, I leave that to the makers, and so distinctly state in Section 8. This statement also answers critic number four on the carbon question. And my previous remarks in defense of the test bar also apply here, adding that I prefer bending by the blows of a sledge, because it gives just the kind of a shock wanted to make the test of the most value. I can successfully bend steel over a former which will break if treated the other way.

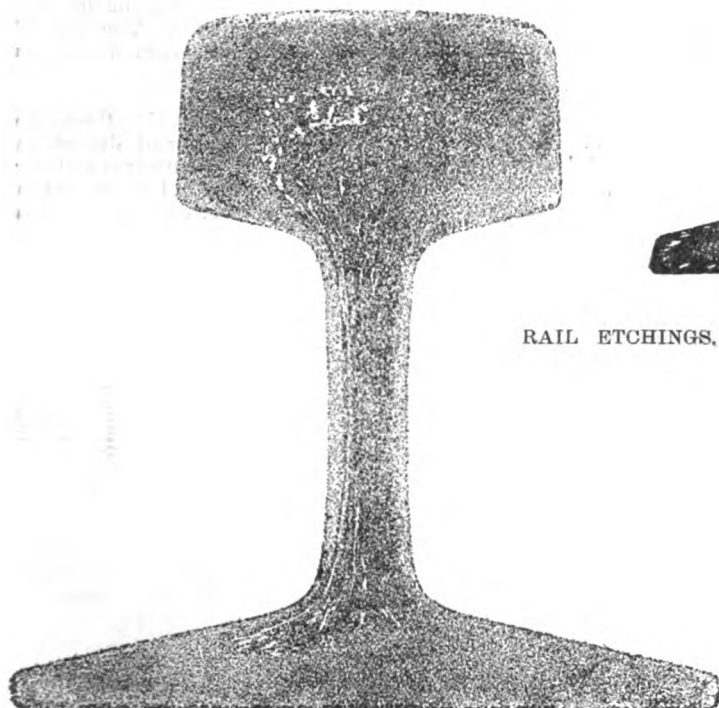
The photographs of broken ingots give the information desired in reference to Section 13. Mr. Forsyth's ingots were



No. 1.

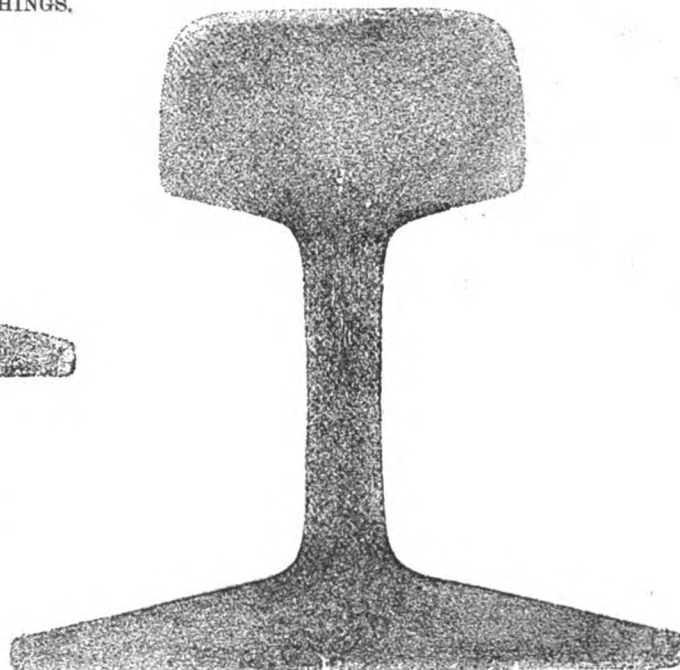


No. 2.



No. 3.

RAIL ETCHINGS.



No. 4.

No. 3.—Chesapeake, Ohio, 75 pounds.

No. 4.—Chicago, Burlington and Quincy, 66 pounds per yard.

mill, and for all of which I am indebted to Mr. Delano, of the C., B. and Q. R. R., plainly exhibit the same interior defects, but in a modified form. It may be said that, even though the interior of these rails is not absolutely solid, it will not affect their wear. Perhaps not, but you are near the danger lines, and I should much prefer a rail showing such a fracture as the following, also given me by Mr. Delano, the first illustrating one which had yielded good service in the track of his road; and I am happy to say it is an American rail. The other one has not yet

my specification, when presented to the American Institute of Mining Engineers, excepting in reference to the five years' guarantee clause. In defense of that I can only say that it is taken almost verbatim from the one given for many years past by

taken out of the molds and pits the very instant they were set sufficiently to be handled, and were cooled in the air. Again, the desire to so treat them caused too much haste in finishing the pouring. In other words, the casting ladle was not

used long enough as a sink-head; hence the cavities at the upper ends of the vertical ones are exaggerated. But that defect is always there to a greater or less extent. This is also largely controlled by

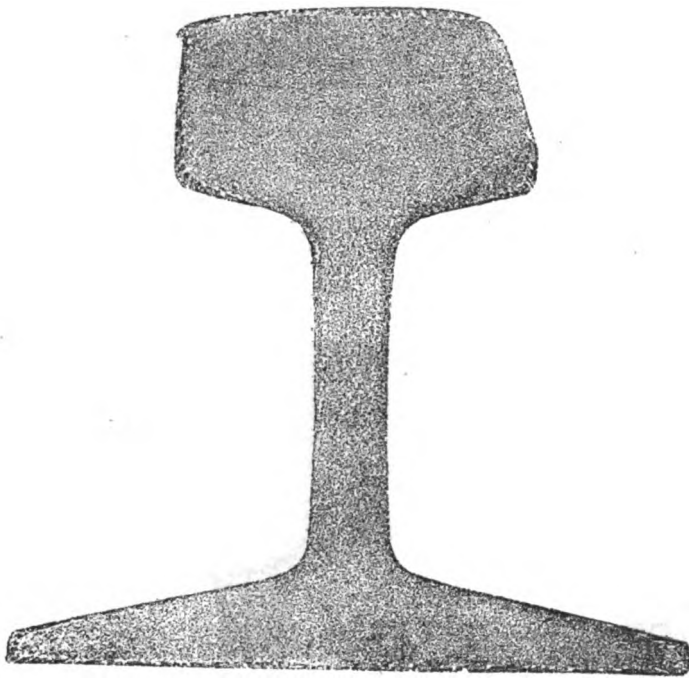
each ton, but making good wages by a large aggregate.

The weaknesses of human nature are well known, even when observed in its most cultivated forms. I know that the

I have no right to complain. You have received answers from five makers. Two of them give me strong indorsement. Another "heartily subscribes to most of what" I recommend. Another disagrees with many of my points, and the other does not see much good in me. I think I can at least claim a "plurality." Calm discussion should lead to good results and I am certain that both rail makers and users have cause to thank *The Iron Age* and the *Railroad Gazette* for their great services in securing the attention and views of so many distinguished representatives of both sides

W. R. HUNT.

ROOKERY BUILDING, CHICAGO,
February 2, 1889.



No. 5.—From Straight Part of No. 4.

Mechanical Test of $\frac{3}{8}$ -Inch Turned Specimen from Head :

Ultimate strength, 85,950 lbs. per square inch.
Elastic limit, 42,780 lbs. per square inch.

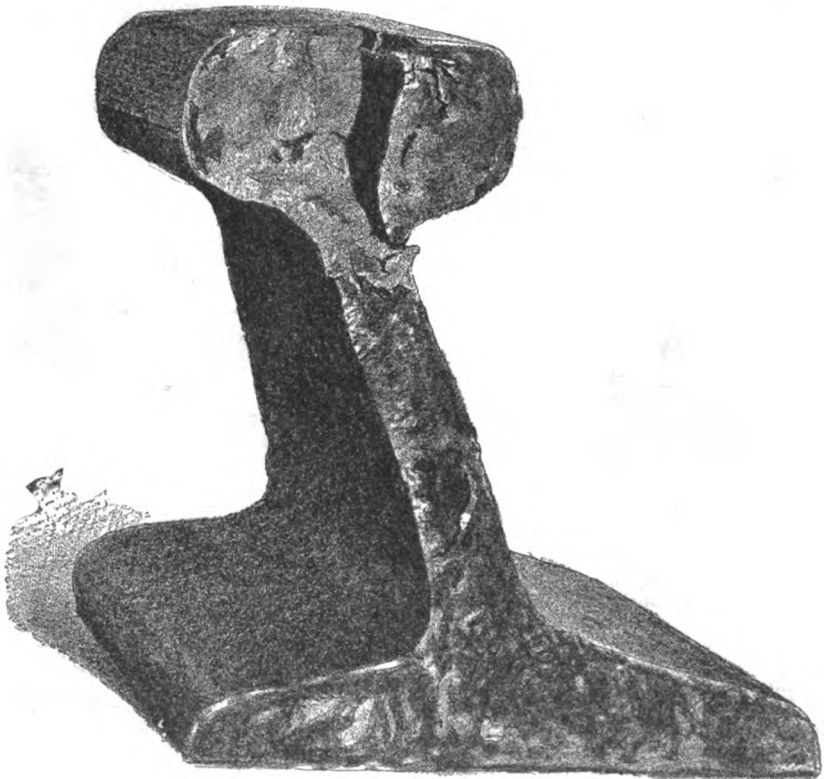
Elongation, 15.62 per cent.
Reduction of area, 43.40 per cent.

the chemical character of the steel. An ingot is a steel casting. Any maker of such castings in finished form can tell you of the character of their top ends. In their practice they make these ends sink-heads, and cut them off. I know of mills where other than heavy rail sections are also made, and it has been their custom to cut off the top end of their ingots with as little waste as possible, and then let any surplus which may exist after cutting the regular rail lengths go into short blooms for light rails. They cut them 12-inch or "greater length preferred" from the bottom or roundest end of the ingot. Perhaps they may never have had trouble from failed ends of their rails. If so, somebody has been pirating their brands.

I thank my friend for his complimentary indorsement of my capacity as a Bessemer steel man, but cannot see that anything but correct eyesight and common sense, added to familiarity with rail making, would be necessary to fit a man to know whether or not rails were being produced in accordance with my specifications. I am certain I do not propose asking any works to train a "new young man" for me. I know of a good many already qualified, and if the railroads should think well of my specifications, and of putting their inspection business in my hands, several of them will be employed by me for them. Let me state most distinctly that I do not propose interfering in the manufacture—do not propose to "run" anybody's works. If it is decided that certain things are not to be done, I propose to assist the makers in carrying out their contract by calling their attention to every time they are done. And I believe a person independent of the mill's personal influence, the pressure of which cannot be realized by any one who has not had personal experience with mill operatives, can do this best. Rails are produced in America at about the rate of one a minute. The men are paid by the ton or piece—quite a small amount for

rail manufacturers desire to give their customers good rails, and I know they always have to sell at the bottom of the market. I know that the railroads want

The elevated railroads during the strike of street-car conductors and drivers in this city last week demonstrated their ability to transport 646,501 passengers in a single day. On three consecutive days



No. 6.—Rail Broken in Track.

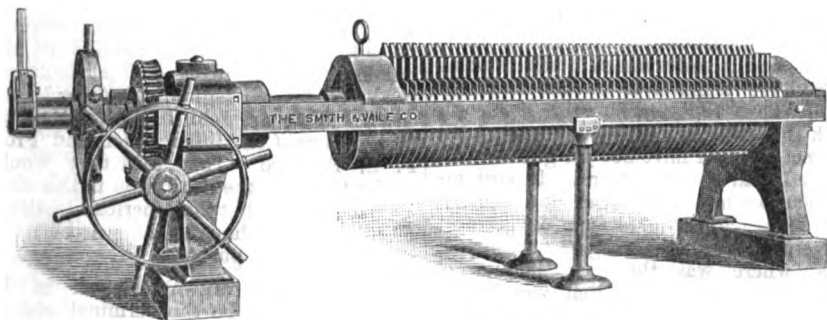
the best rails possible for the least money. I desire to assist both sides.

My last friend honors me with a pretty strong indorsement of my specifications, for which I thank him, and hope the others will modify their views on the points of difference between us. However, I think

the total number carried was about 1,900,000, and in no instance is it known that any individual suffered personal injury. The comparatively little inconvenience that was experienced from the interruption of travel on the horse-car lines was due to the prevalence of fine weather.

New Filter Press.

The Smith & Vaile Company, of 112 Liberty street, New York, are introducing a new Filter Press, of which we herewith present an illustration. The feed is central, the filtering medium being formed of specially woven cloth, held between cast iron plates, supported by legs to slide along the frame. In the machine shown, power is obtained by a worm and gear attachment, operated by a hand-wheel. Great power can be secured by this arrangement, and a perfectly tight joint can



FILTER PRESS, BUILT BY SMITH & VAILE, DAYTON, OHIO, AND NEW YORK.

be obtained against a pressure of 500 pounds or more per square inch on the press plates. In cases where a maximum pressure of 150 pounds per square inch is required, but a greater number of plates than 86 are used, the gear attachment is necessary to secure tight joints, as there is not sufficient power in the end wheel. The same company also build various styles of presses to suit the work for which they may be required.

Another Rolling Mill Projected at Chicago.

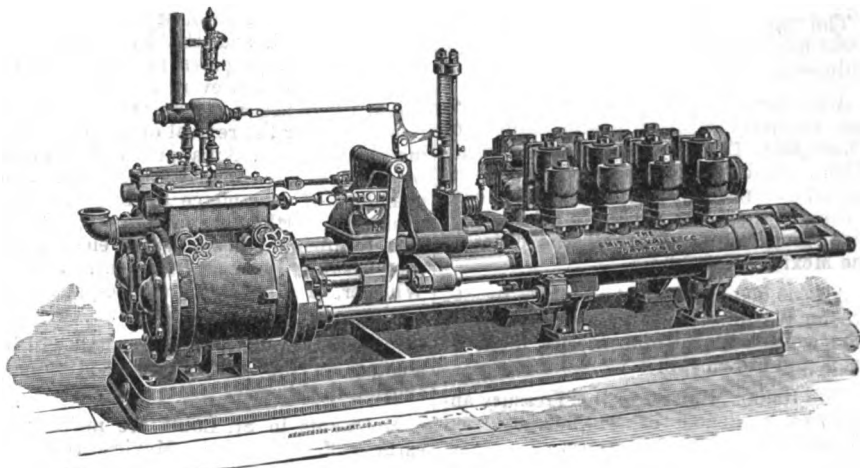
The depression in the iron trade does not discourage the projection of new enterprises for the purpose of adding to the production. Our industrial items show an activity in this respect which is quite remarkable. The low prices now ruling for iron and steel are regarded as affording a safe basis on which to calculate the probable success of such a venture. If a profit can be figured under the circumstances and conditions now existing, it is argued that no hesitation need be felt about engaging in the trade and taking the necessary risks. Then, too, a plant can be built and equipped with the very best machinery and most modern appliances far cheaper when iron is low and times are dull than when business is brisk, machine shops are pushed with work and material is dear. Those who have the capital at command and can obtain good locations for the assemblage of materials and the sale of their products are wise in building works in times of depression. They are then ready, with a minimum expenditure for their plant, to compete on an advantageous footing for the business offering, while a resumption of activity gives them greater profits than competing works can secure which have been built at much higher cost.

With such a purpose in view the erection of a new rolling mill at Chicago is contemplated. It will be operated by a corporation under the name of the National Forge and Iron Company. The capital of the company will be \$250,000. The president and principal stockholder is Marks Swarts, senior member of the firm of Swarts & Nathan, well-known dealers in scrap iron. Mr. Swarts is familiar with the operations of machinery, and his ex-

perience in the scrap-iron business will enable him to purchase the necessary material for the company's use with rare judgment, but he will have associated with him Wm. J. Quailey and other practical rolling-mill men to insure the success of the mechanical department. Seymour Swarts, his son, is secretary and treasurer, and is well qualified for such a position by his business training and natural aptitude. The exact location of the proposed works will be made public shortly, but the site selected is in the immediate vicinity of Chicago, so as to save freight on the scrap

used, which will be obtained from local sources, and also to save freight on the finished product, which will be marketed mainly in Chicago. The office is located at 557 State street for the present.

The machinery will comprise two trains of rolls, one 10-inch and one 18-inch, operated by one 500 and one 250 horse-power engine; a lever shear, with engine, to cut 5-inch rounds cold; five other shears, to cut small iron, scrap, &c.; two large steam hammers; one rotary squeezer, weight



DUPLEX HYDRAULIC PRESSURE PUMP, BUILT BY SMITH & VAILE, DAYTON, OHIO, AND NEW YORK.

95,000 pounds, to take a 250 to 275 pound ball; six busheling furnaces, three double heating furnaces, one extra shingling furnace, and three heating furnaces for the forge. The works will make a specialty of iron for railroad cars, car axles, &c., but will also make all sizes of merchant iron and fish plates. Oil will be used for fuel. It is the intention of the company to make their mill complete in all its appointments, and they expect to have it in operation inside of six months.

A disastrous fire in Buffalo on Saturday destroyed 40 buildings, including several large business houses and the Broezeel House, and the entire loss will probably

amount to \$3,000,000. The fire originated in the Root & Keating building. Directly opposite was the five-story brick and iron stove warehouse of Sherman S. Jewett & Co., supposed to be a fire-proof building, and also the new six-story candy manufactory of Sibley & Holmwood. Both were soon a blazing ruin. The hardware store of Fowler & Son shared a similar fate. Sidney Shepard & Co. are to be congratulated that the fire stopped just before reaching their building, contrary to the telegraphed report. The loss sustained by Fowler & Son is estimated at \$90,000, while that of S. S. Jewett & Co. is reported to be as high as \$200,000. Chief Harmon, of the fire department, speaks of defective construction. He says: "Roofs here are laid directly upon the walls, and it was in this weak spot that the flames gained entrance to the Jewett building. If the roof had been battlemented and the walls built above the roof a foot or two, the building could have been saved."

Duplex Hydraulic Pressure Pump.

Several marked improvements have been made in these pumps by the makers, the Smith & Vaile Company, of Dayton, Ohio, and 112 Liberty street, New York. These changes are mainly confined to the water end, the steam end being the regular duplex arrangement. Each pump cylinder is divided into two parts by a central partition, so that there are practically four cylinders, in each of which works a plunger. Each of the rear plungers is operated by a piston rod united to a crosshead connected by rods with the forward crosshead. The upper of the two parallel rods rests in half bearings placed on top of the cylinder. Two of the plungers are constantly working on the discharge and two on the suction, making the flow even. Connected with the dis-

charge-pipe is a safety valve which, by operating the governing throttle, obviates all danger that might be caused by too great pressure. An accumulating reservoir is used with small-sized pumps, the object being to work the pumps continuously in cases where the demand is intermittent.

President F. J. Kimball and a party of officials and gentlemen representing railroad, manufacturing and financial interests have left New York on a prospecting trip through the coal and iron fields of Southwestern Virginia and the mines of Pocahontas. Andrew Carnegie and other large iron manufacturers are with the party.

THE WEEK.

The United States Government has chartered two clipper ships to carry 5000 tons of anthracite coal to the harbor of Pago Pago, in the Samoan Islands, which is to be used as a Government coaling station for vessels plying in the Pacific waters. The freight rate will be \$13 per ton and discharged. It is expected several other ships will be chartered for the same destination in a few days.

Gen. James W. Husted's bill appointing commissioners to represent the State of New York at the Centennial celebration in New York City, on April 30, of the inauguration of President Washington, is now in the hands of the Governor. The commissioners are Brayton Ives, Walter Stanton, D. O. Mills and Gen. Louis Fitzgerald. By the bill \$200,000 was appropriated, of which \$125,000 goes to pay the transportation, maintenance and service of the National Guard of the State.

The foreign relations of China are liable to be put in jeopardy and the introduction of a modern civilization be retarded by the accession to power of the young Emperor, who is now 17 years old, and who is expected to make Ung Tung Ho head of the Grand Council. The North China *News* says: "The Emperor, the three Princes and the Empress Dowager are all pure Manchus, but Ung Tung Ho is a Chinese. and comes of a very ancient and renowned family. He is strongly opposed to foreigners and foreign ways, and his great influence with the Emperor will probably lead to a vigorous attempt to retard the introduction of railways and all Western innovations. It will also, in all probability, lead to strained relations between the Chinese Government and the representatives of foreign powers, which will bring about a very critical state of affairs not at all unlikely to end in war."

The wages of Chinamen on the Pacific Coast have doubled since the stoppage of Chinese immigration.

A St. Louis dispatch says: "An American company with a capital stock of \$5,000,000, D. W. Dewey, of Pontiac, Mich., president, have secured a contract, signed by President Diaz and others, conceding to them the exclusive privilege of furnishing water gas to all the cities in the Mexican Republic."

A \$500,000 hotel will be built in Brooklyn on Washington and Concord streets. The walls will be nine stories high, of brick and brown stone.

The Italian Minister of the Treasury announces a deficit of \$40,000,000, and higher taxes will be necessary.

The Manual Training School in Cleveland, Ohio, which has 185 pupils, gave an exhibition at the commencement exercises last week of an interesting character. The institution is supplementary to the education of the public schools. On the occasion referred to about 500 spectators witnessed the forge and cabinet shops in full operation, and among the articles manufactured were chains, which were pronounced equal to the productions of an accomplished artisan. The same is true of the wood-turning shop, where a large number of boys were engaged. They handled their lathes like men who were accustomed to the business, and excited applause by their skill. The work of the boys was complimented on every hand, and Professor Anderson came in for his full share of praise.

It is said that a contract for a new bridge at Niagara Falls has been let to the Rochester Bridge and Iron Works. New suspenders will be attached to the present

cables, and the bridge will be nearly the same as the former one. The work will be conducted from both sides of the river toward the center. Engineer George McNulty, of New York City, will be in charge, and the present estimate is that May 15 will show the bridge complete.

A large bridge across Newark Bay will be necessary to complete the proposed connection of the Lehigh Valley road with a new terminus at the Morris Canal in Jersey City.

The *papier maché* ceiling for the State Assembly was made in New York City by J. M. Sinclair, for John Smith, the contractor. Mr. Smith thinks he is much abused, and is embarrassed while waiting for \$40,000 claimed to be due from the State. To a reporter he said: "People think I have made a fortune out of the contract, while I have not yet got out the money I paid for the work. It cost me \$54,000 to remove a staircase and \$80,000 more for machinery, staging, &c., before one scrap of the old ceiling was removed. Now, where was the vast amount of profit? The old stone that was in the ceiling, and which there has been so much talk about, I will give to any one who will pay for carting it away. I'll sell it to you for \$2500 this minute."

An ex-Prime Minister of Hawaii, C. C. Moreno, who is remarkably well informed respecting commercial affairs in that part of the world, argues that Samoa is the key of the Pacific trade, and that San Francisco on the west, Honolulu in the center and Shanghai on the east ought to be the clearing-houses for all the islands of "an American-Asiatic lake."

The American Shipping and Industrial League concluded its sessions in Washington, D. C., on Friday night. General Wheeler presided. Representatives Farquhar, Thomas, Money, Boutelle and Spindola and ex-Congressman Ellis, of Louisiana, delivered addresses. Subsidies or bounties to American-built ships were advocated by all, and the French bounty scheme, which proposes an allowance of 20 cents per ton for every thousand miles, was strongly urged as being the most feasible means for the revival of our decaying merchant marine. An appeal will be made by the league to every board of trade and chamber of commerce throughout the country in furtherance of this proposition. The following officers were elected for the ensuing year: President, Joseph Wheeler, of Alabama; first vice-president, Ambrose Snow, of New York.

A million-dollar amusement hall will be erected on the site of Madison Square Garden in this city.

Merchants in St. Louis are making an earnest effort to capture Mexican trade by establishing agencies at central points in that country, and they profess to be able to transport merchandise by rail, direct, at one-third of the charges on freight via New York.

Boston spends from \$12,000,000 to \$15,000,000 a year on new buildings. Among the latest additions are the Mutual Life, costing \$500,000; Fiske Building, \$700,000 to \$800,000; Albion Building and Miliken House, costing about \$400,000 to \$500,000 respectively. A syndicate is about to erect a structure on the old post office site which will cost \$3,000,000, making one of the finest buildings of the kind in the country. The Chamber of Commerce will soon put up a building.

San Francisco is doing a thriving business with Australia, and expresses much satisfaction over the statistics of traffic for 1888. Imports amounted to \$1,414,000, which differs little from the previous year, but exports nearly doubled, the total valuation for 1888 being \$1,822,054, as com-

pared with only about \$1,000,000 for 1887. The increase is principally in the exports of lumber and grain. Of machinery, 2413 packages, valued at \$178,820, were shipped from San Francisco during the year, and of hardware the exports were \$50,000.

The new Chamber of Commerce at Cincinnati, dedicated last week, cost \$625,000, and the whole property is valued at \$1,000,000.

The New York aldermen peremptorily deny the application for permission to build a tunnel under the East River.

A committee of business men of Birmingham, Ala., sent North to select a place for a permanent exhibition of the mineral, manufacturing and agricultural products of their region, called on Mayor Grant. They are John T. Patrick, Dr. W. R. Capehart, Col. Julian Allen and Prof. F. S. Packard. They said they would prefer to locate the exhibition in this city. They had looked at the American Institute building, but thought it scarcely big enough for their purpose.

The grandest railway station in the world is said to be the terminal station in Bombay, India, of the Peninsular Railway, known as the Victoria Building, which was completed in last May and named in honor of the Empress of India. The execution of the work occupied ten years, and the cost is estimated at \$18,800,000. The total length of the principal elevation is over 1500 feet.

The importation of hog products into Holland is prohibited, refined lard excepted, unless accompanied by a document from the Dutch Consul showing that no disease to which hogs are subject prevailed at the time and place of shipment.

Further successful tests were made with the Zalinski gun. A shell weighing 980 pounds, the heaviest yet put into the gun, was loaded with 500 pounds of nitro-gelatin and dynamite. In military circles it is said Captain Zalinski will get the appointment as Assistant Inspector General.

The net income of the United States Patent Office last year was \$144,408 and the number of original patents issued was 20,000. The patent fund amounts to \$3,400,000.

Another of Jay Gould's formidable railway projects has been consummated, being nothing less than an alliance with the Richmond Terminal Syndicate for the protection of his Missouri Pacific branches in the Southwest by building a new section of road through the Indian Territory at the northeastern corner. The general design takes within its scope a route that shall extend from Kansas City to the Atlantic seaboard. The advantages of this important alliance are, it is explained, that the Missouri Pacific will obtain a large amount of traffic from the great provision-producing regions of the West that is now distributed through the South by way of St. Louis. It will also offer a short haul to the seacoast at Brunswick and other Southern ports.

The railway connections between the Poughkeepsie bridge and the new center at Campbell Hall will be completed by June 1st, opening traffic in that direction.

Chancellor Bismarck informs his minister at Washington that the German military authorities in Samoa "have gone too far," and M. Knapp, the German consul at the islands, is ordered to withdraw his command. Secretary Bayard informed the Government at Berlin that no declaration of martial law in Samoa could extend jurisdiction over American citizens, nor would such jurisdiction be recognized.

A new field for American enterprise is opening in Persia, if reports are correct. Frank H. Clergue, of Bangor, Me., has

petitioned the Legislature of that State for railway and bank charters to cover various projects in the domains of the State, including a railroad 500 miles long, from Teheran to the Persian Gulf. The nature of the work will require the assistance of American engineers. It is said that the equipment of the railway will also be sent from this country. The locomotive and heavy rolling stock are to be built in Philadelphia.

The views of business men in Michigan respecting the Interstate Commerce law have been gathered by a Detroit editor, but the result only shows a wide divergence of opinion. The majority speak reservedly, some approving of the law if it were enforced without discrimination, while others heartily condemn it and are clamorous for repeal. Hardware dealers nearly all either condemn or approve with reservations.

Major David Essex Porter, who was on General Grant's staff and served in the Egyptian campaign against Abyssinia, has contracted with the Haytian minister, Mr. Preston, to act as chief of staff under Légitime, taking entire charge of the forces, and he has already taken from New York a number of field pieces and howitzers. Collector Magone has been instructed to enforce the neutrality laws.

The International Company, of Mexico, which originated in Hartford, Conn., claims to have had good success in efforts to colonize Lower California, and to have formed several Swedish settlements on the coast. The company's grant extends from the boundary line between Mexico and the United States, 15 miles south of San Diego, southward between the Pacific Ocean and the Gulf of California for a distance of 300 miles, comprising a region described as comparing well with the region around Los Angeles or Santa Barbara. All industries are exempt from taxation for some years to come. The Mexican Government, probably to the disappointment of the projectors, shows no disposition to alienate any part of this territory in favor of the United States.

To show the magnitude of the canning business the fact is mentioned that in this country last season there was packed of a single kind of vegetable nearly 80,000,000 cans, costing at the point of production about \$6,000,000.

The population of the United States at the present time is believed to be very nearly 64,300,000, allowing an addition of upward of 500,000 during the last 12 months, indicating a probable increase equal to 67,000,000 for the census year 1890.

Writers in Cleveland and Pittsburgh evince a deep interest in the completion of the South Pennsylvania Railroad, by which a new route will be opened between the lakes, and the coal beds and iron furnaces of Pennsylvania. Confidence is expressed that the project will be pushed forward as soon as possible in the spring.

A private banking house in this city forwarded to Sweden last year more than \$1,000,000, the earnings of Swedes who immigrated to this country. Of 44 Swedish cabinet-makers who came over here about 1878 under contract to work for the Bridgeport Organ Company, 15 now own their own homes in Bridgeport, which they have paid for in these ten years.

The business of the largest post offices in the country increased 9 per cent. during the quarter ended December 31 over the corresponding quarter of the previous year.

The Master Car Builders' Association will meet in Buffalo next June, when a committee will report on "car heating and lighting."

MANUFACTURING.

Iron and Steel.

Williamson Furnace, of the Williamsson Iron Company, at Birmingham, Ala., has been thoroughly overhauled. The Massick & Crook hot-blast fire-brick stoves, for which McClure & Schuler, of Pittsburgh, are the agents, have been introduced, and the furnace has been partially relined. With the new attachments, the capacity of the furnace will be increased from 60 to 75 or 80 tons per day. The furnace went into blast last week.

The Brierfield Coal and Iron Company, of Brierfield, Ala., are repairing their rolling and nail mills, and will, it is said, put them in operation.

The Beaver Falls Iron Company, of Beaver Falls, Pa., have decided that, for the present at least, they will not rebuild their plant destroyed by fire some weeks ago. The reason advanced for this determination is, that with the present low price of sheet iron it will not pay to operate the works. Should an improvement in this line take place, it is probable that the company will rebuild their plant.

As announced in these columns some time since, Carnegie Bros. & Co., Limited, of Pittsburgh, have decided to build a large foundry adjacent to their present plant at Braddock, Pa. With this in view Tonsten Berg, head draftsman at the Edgar Thomson Steel Works, has gone East to visit the foundries at Bethlehem and Philadelphia in the interest of the firm, and to inspect the methods which are used in their operation and construction. Work will be commenced soon after Mr. Berg's return. Some of the machinery has already been ordered for the foundry, which they expect to have in full operation in the course of three months.

New machinery and new furnaces are being added to the old butt weld mill of the plant of the National Tube Works Company, at McKeesport, Pa., the company having decided to manufacture a large size of the butt weld tubing. The largest size now made is 2 inches. The new mill will be ready for operation in about a month.

Recent large orders at the Philadelphia Bridge Works, Pottstown, Pa., necessitated the starting of a double turn and the putting on of about 100 additional men. Many of the Pottstown Iron Company's nailers have secured employment there.

Hunnewell Furnace (charcoal), at Hunnewell, Ky., has blown out for repairs.

Thomas Furnace, of the Thomas Furnace Company, at Niles, Ohio, which was recently considerably damaged by fire, will be ready to make iron about the 20th inst. Wm. Tod & Co., of Youngstown, Ohio, have received a contract to erect an iron hoisting-house at the furnace.

The Atlantic Iron Works of P. L. Kimberly & Co., Limited, at Sharon, Pa., are being operated to their utmost capacity. The puddling department cannot work up enough muck iron to supply the finishing mills, and the firm are compelled to import muck bars from the Etna Iron Works, Limited, at New Castle, Pa.

The nail factory of the Belmont Nail Company, at Wheeling, W. Va., has been closed down on account of some trouble with the workmen. It is not known when operations will be resumed again.

The French Creek Forge, near the falls of French Creek, Chester County, Pa., operated by Thomas Warner, went into operation last week, after lying idle some time. The proprietor has now orders on hand which will keep the works going for

two months or more. French Creek Forge manufactures blooms from scrap and is one of the few charcoal forges still in operation in that part of Pennsylvania.

A press dispatch from Cincinnati, under date of the 30th ult., says: "The Newport Iron and Steel Works, formerly owned by E. L. Harper, were sold for the second time to-day under legal proceedings to C. J. Helm, representing the sureties for the former purchasers, Schriver & Wagner, for \$70,000."

A report was circulated in Pittsburgh last week to the effect that some capitalists were endeavoring to lease the Millvale Rolling Mill, in that city, and would put it in operation if successful in procuring a lease of the property. This mill was formerly owned and operated by Graff, Bennett & Co., but has been idle since the failure of that firm some months ago.

Preparations have been completed for the starting of the converting department of the new works of the Allegheny Bessemer Steel Company, located at Duquesne, Pa., a few miles from Pittsburgh, on the line of the Pittsburgh, Virginia and Charleston Railway. The entire plant is completed. The buildings as they now stand are entirely of iron. The converting and blooming mills are in one building, the dimensions of which are 75 x 200 feet. The rail mill is 68 feet span and 380 feet in length. The building covering the hot-beds is 80 feet span by 200 feet in length, while the wing inclosing the finishing machinery is 48 x 64. There are two Bessemer converters with a capacity of 7 tons each. At the commencement of operations natural gas for fuel will be supplied by the Philadelphia Company, but in the near future the plant will be supplied from an independent line to be laid to wells located in Versailles township. To supply the steam for the rail mill there are 20 boilers, 44 inches in diameter and 24 feet long, and for the converting department 16 boilers, with similar dimensions. These were all furnished by James McNeill & Bro., boiler and general machinery manufacturers, of Pittsburgh. The company will have a general office at Duquesne, and will also continue their present branch office in the Hamilton Building, at Pittsburgh.

The Fishbach rolling mill of the Pottsville Iron and Steel Company, at Pottsville, Pa., was again closed down on the 30th ult. for an indefinite period. It will be remembered that this plant suspended operations in December last, but resumed several weeks since. It is stated that operations may be resumed again within the next 30 days, but this will depend entirely on the amount of orders that are received in the meantime.

Announcement is made that the interests of the Warren Rolling Mill, at Warren, Ohio, under the management of Henry Wick, have been consolidated with those of the Trumbull Iron Company, at Girard, Ohio, under the management of George Wick, and that the main office will be located at the latter-named place. The consolidation went into effect on the 1st inst.

At the annual meeting of the stockholders of the Cambria Iron Company, of Johnstown, Pa., held in Philadelphia last week, the following officers were elected: E. Y. Townsend, president; Powell Stackhouse, vice-president; John W. Townsend, formerly assistant to the president, second vice-president; William S. Robinson, secretary and treasurer, formerly secretary and succeeding John T. Killé as treasurer; Harvey Ellis, assistant treasurer. The board of directors chosen is composed of E. Y. Townsend, I. V. Williamson, Samuel Welsh, James McMillen, Josiah M. Bacon, R. Francis

Wood, David Reeves, Henry Lewis and Robert F. Kennedy. The board has since elected Charles F. Butler assistant treasurer at Johnstown and A. P. Robinson assistant secretary at Philadelphia.

It is expected that the large new plate mill now in course of erection by the Maumee Rolling Mill Company, of Toledo, Ohio, will be ready to commence operations about the middle of March.

The *Bulletin* of the American Iron and Steel Association announces that the Union Steel Nail Company, of Omaha, Neb., has abandoned its works at that place. It will continue its corporate existence, however, for the purpose of caring for its real estate interests, which are centrally located in the city of Omaha and are very valuable. The officers of the company, last October, organized the Union Steel and Iron Company at St. Joseph, Mo., receiving from the citizens of that city a cash bonus of \$50,000. A donation of four blocks of ground was also received from the South St. Joseph Land Company. The buildings for the new company are now being erected, and it is expected that active work will be commenced early in the coming spring. New machinery has been purchased, and merchant bar iron, wire nails and cut steel nails will be manufactured. The company will make its own muck bar.

The new Bessemer addition to the Crescent Steel Works of Miller, Metcalf & Parkin, at Pittsburgh, which has been in course of erection for some months, is almost completed, and will probably be put in operation during the present month. The engines, converters and hydraulic cranes are all in place. With this addition to their works completed the above-named firm will have one of the most complete and best-arranged plants for the manufacture of steel.

Morehead, Brother & Co., proprietors of the Vesuvius Iron and Nail Works, at Pittsburgh, have closed down their entire plant for an indefinite period, on account of the high rates for natural gas asked by the Philadelphia Company, which have been supplying the firm with fuel for some years. According to a member of the firm, their contract for gas expired on the 31st ult., and the Philadelphia Company demanded an advance of \$6000 over the rate paid for the previous year, which was refused. This firm remodeled two of their double-puddling furnaces some time ago, and have since operated them very successfully on fuel gas made from slack coal. The work was done by Wm. Swindell & Bros., engineers and contractors, of that city, who have since closed a contract with the firm for the remodeling of all their puddling furnaces on the same plan. Whether the firm will allow their plant to remain idle until this work is done has not as yet been determined.

The Colorado Coal and Iron Company have refused an offer of over \$1,000,000 for their lands in and around South Pueblo. The company's output of pig iron at Bessemer in 1888 amounted to 20,800 tons; steel rails, 8040 tons; merchant bars, 5800 tons; cast-iron water-pipe, 1340 tons; nails, 45,080 kegs; railroad spikes, 1380 kegs.

The Lucinda Furnace Company, of Norristown, have placed with Messrs. R. S. Newbold & Son, of the same place, a contract for one 27-pipe Durham hot-blast stove, together with other changes and additions. The improvements are in charge of Frank C. Roberts, C. E., of Philadelphia.

Floodwood Furnace B, at Floodwood, Ohio, built by Riter & Conley, and owned by the Ohio and Western Coal and Iron Company, is 17 feet in the bosh and 75

feet high. It runs on a mixture of 80 per cent. native ores, 50 per cent. Lake Superior ores, and 25 per cent. mill cinder. The fuel consumption is 2800 pounds coke to the ton of iron made. The following is the iron made by this furnace during the month of January:

No. 1 foundry.....	4,175 tons.
No. 2 "	237 "
No. 3 "	97 "
Total.....	4,509 "

R. C. Porter is manager and Gen. James A. Hall superintendent.

The Cambria Iron Company, of Johnstown, Pa., are increasing the blast pressure of their furnaces, and this affords a greatly increased output of Bessemer pig metal. They have also a new Bessemer steel plant nearly completed, which will afford a much increased output of steel. It is expected that this new work will go into operation about the 1st of March next. The company are also extending their open-hearth furnaces and enlarging their Krupp metal washer. They are also active in their Gautier department, where they make a large variety of steels and other products for the market.

The Birmingham Rolling Mill Company of Birmingham, Ala., have issued a neat little pocketbook giving the standard Western list in bars, bands, angles and sheet iron, elaborate tables of weights of flats, rounds, squares, tire, ovals, spikes, sheets, plates, angles, tees, hoops, bands, &c. They present, in addition, a variety of useful information, and submit a cipher code for ordering their goods for the convenience of their customers.

The Ramel, Conley Iron and Steel Company, of 290 Broadway, have made a contract with Delameter & Co. for the iron work for their new plant at Brewsters, N. Y., and are arranging for the brickwork, &c. The process is not a modification of the Blair, as erroneously stated recently, but is based on the Conley patents. The company contemplate the erection of a 15-ton open-hearth furnace, with gas producers, in the near future.

In referring lately to the great record of No. 1 Andover Furnace, of the Andover Iron Company, at Phillipsburg, N. J., we stated that we did not know to what extent the use of Lake Superior ore influenced the splendid results. Joseph C. Kent, the superintendent, informs us that not a pound of Lake ore was used. The product made during the week in question (824 tons), was produced with 90 per cent. of New Jersey ores and 10 per cent. of Mokta. The week following the make was 826 tons with all New Jersey ores.

Machinery.

A strike has occurred at the works of the Springfield Mfg. Company, at Springfield, Ohio, caused by some of the men demanding an increase of wages, which was refused by the firm. The strikers attacked a workman who had taken the place of one of their number, and he was quite severely injured. Policemen were at once placed on guard at the shops and no further trouble is anticipated. The firm expect to have no trouble in filling the places of the strikers.

The Pittsburgh Locomotive Works Company, of Pittsburgh, have secured a contract for three locomotives for the Louisville, Vandalia and Terre Haute Railroad Company.

The Benjamin Machine Company, whose works are at South Evanston, Ill., and general offices in the Home Insurance Building, Chicago, have just issued a very complete catalogue of their wood-working machinery. The book comprises 74 broad pages, is finely illustrated and well printed, and is bound in flexible covers.

The illustrations are of such a character that the internal as well as external structure of the various machines is shown. The leading machines illustrated and described are the Corporation Triumph planer and matcher, the New Triumph planer, the Special Triumph planer and matcher, the Old Triumph planer and matcher, the patent all roll double cylinder surfacer, the patent improved Triumph dimension planer, the Triumph timber planer, the Improved endless bed surfacer, panel planers, automatic knife grinders, re-sawing machines, band saws and band saw mills, together with a variety of planing and saw-mill supplies. The descriptions given are very clear, setting forth the special character of work to which each machine is adapted. Full price lists for special machines and general mill supplies are given, as well as a great deal of information of value to millwrights and users of machinery. The company have recently removed their works to a new location at South Evanston, where they occupy buildings specially adapted to their purposes. They have four special departments—namely, machine shop, blacksmith shop, foundry and wood-working shop, including paint shop. These departments are supplied with tools of the latest design, enabling the company to make all parts of their machines on the premises. A railroad track enters on the side of the works, affording facilities for the receipt of material or shipment of goods without cartage.

Hooker Colville Steam Pump Works, St. Louis, Mo., are very busily engaged, and among the orders lately received mention the following: A vertical pumping engine for the water works at Canton, Ill.; also two 500 horse-power boiler-feed plunger pumps, one to St. Louis Illuminating Company, and one to Anthony & Kuhn Brewing Company, St. Louis, Mo.

Fifty-four men were discharged at the New York, Pennsylvania and Ohio Railway shops, in Meadville, Pa., on the 31st ult. This is in compliance with a general order reducing the shop force on the entire Erie system 10 per cent. It will affect about 100 employees on the New York, Pennsylvania and Ohio, and about 300 on the other branches. The reason assigned is lack of business.

The Westinghouse Electric Company, of Pittsburgh, recently made a shipment to Havana, Cuba, of over 12,000 of the glass globes containing the incandescent electric burners. They were securely packed in casks made of heavy tin.

At a meeting of the Directors of the Union Switch and Signal Company, of Pittsburgh, held last week, it was decided to declare a 6 per cent. dividend on the preferred stock of the company. The company have a capital stock of \$1,500,000, of which amount \$500,000 is preferred stock. The latter is entitled to a dividend of 6 per cent. before the common stock receives any; and it is also entitled to a further dividend of one-half of 1 per cent. for each one 1 per cent. paid on the common stock until all the stock receives 12 per cent. The total amount of profits of the company during the last year amounted to \$80,000, of which sum \$30,000 was used to reduce the company's indebtedness.

The Innis Mfg. Company, of Oil City, Pa., have sold their works and property to the Oil Well Supply Company. The latter will continue to manufacture the Innis engine at the old place, with Mr. P. H. Kane as superintendent. Some of the manufacturing now done at the Oil Well Supply Company shops will be transferred to the Seneca street branch, the capacity of which will be materially increased.

The Iron Age

New York, Thursday, February 7, 1889.

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF, JR., - - EDITOR.
GEO. W. COPE, - - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS, - - - HARDWARE EDITOR.
JOHN S. KING, - - - BUSINESS MANAGER.

American Pig-Iron Warrants.

We believe that we are correct when we make the statement that, broadly speaking, the men interested in the American iron and steel trades are adverse to any extraneous influences. The first impulse of a good many makers, dealers and consumers appears to be to assume an attitude of hostility to the plans of the American Pig Iron Storage Warrant Company, whose plans we outlined in the last issue of *The Iron Age*, and whose argument in favor of their scheme we placed before the trade.

The primary object of the company is to create a medium for speculation by the general public. The larger the quantity of pig iron in their storage yards the greater will be their income, and the larger their profits. The quantity will be measured by the capacity of the speculative public to pay the relatively low cost of carrying the stock and by the success attained in securing the co-operation of furnace companies. The former will be dependent upon the magnitude and frequency of the chances of securing a profit by betting on the right side of the market. The latter will be measured by the advantages which might accrue to them from steadier work and cheapened cost of marketing. Speculators and their brokers will be indifferent to everything which is not connected with the prospect of a "lively market." Brisk fluctuations, a large volume of transactions, with the occasional excitement of a corner, is all that they ask. The interest of the projectors of the enterprise lies with these, aside from any schemes which some of those identified with the movement may or may not cherish in connection with individual speculative operations. The general public is to pay for the privilege of taking a flyer in pig iron, the cost of storing and carrying it, plus a profit to the American Pig Iron Storage Warrant Company. While the latter have no intention to take any action to make operations in warrants attractive to speculators, it is clear that the impetus must come from some source, if pig iron is to have greater success than silver. Whether, by whom, how and when this work is to be performed, is not apparent yet. Possibly a protracted period of "wash sales" may be necessary, possibly not, because pig iron has always possessed a high standing in the speculative community as the "barometer of trade." The first step in the direction of success, from the standpoint of the projectors of American pig-iron warrants, has been taken by coupling with the enterprise a number of men whose financial position is above all question.

Success is dependent, secondly, on the co-operation of the furnaces. Much is made of the fact that until now the stocks of pig iron in this country are out of all proportion to the quantity produced. They represent only a few weeks' con-

sumption. It is argued that this fact is one of the greatest sources of danger to the American iron trade, an argument the force of which few will be willing to deny. For some time to come the accumulation of pig iron through the operations of the warrant system would be without any danger to the American iron trade. It would benefit it by allowing of continuous and steady work, even during a depression, and would thus afford some relief. But, if history repeats itself, and the experience of Scotland has any value as a guide to us, a point would be reached when the accumulations would be unnecessarily large and might become a serious burden and a menace to the trade.

To those furnaces which have a small working capital and limited resources, and who therefore have been unable to carry themselves over periods of depression without making serious sacrifices, the chance to run pig iron into store and quickly realize on it will be welcome. Their rivals, more securely placed, may view the scheme with indifference, unless, indeed, they regard as an injury to them everything which aids their competitors. The position of commission merchants to the warrant system appears to affect its success or failure only in so far as their opposition would render it much more difficult to interest the general public. It is the natural impulse of every man doing business, whether it be speculative or not, to seek an expression of opinion from those among his friends and acquaintances who have long been identified with the particular trade affected.

We are in receipt of a number of letters from pig-iron makers, commission merchants and consumers, which we shall print in the next issue of *The Iron Age*. They will furnish ample evidence to gauge the position of the trade on a momentous question. One view, frequently expressed, is that it is only a question of time when the methods in vogue in Great Britain will be introduced here. It is urged that however widely opinions may differ on the ultimate effect of extensive speculation in pig iron, the matter is bound to come, and that he is wiser who swims with the tide than he who exhausts himself in vain efforts to stem it.

Production of Pig Iron in the West.

The development of the pig-iron industry in the South has received so much attention in recent years that the growth of the West has been somewhat ignored. Yet this section of the country has been making very steady progress, and it is now contributing a larger share than ever of the total amount of pig iron annually consumed in the United States. In considering the relative importance of the various sections in which the pig-iron industry has been firmly rooted, it will not do to overlook the influence of the States lying north of the Ohio River which derive their supply of iron ore mainly from the Lake Superior mines. Ohio, Indiana, Illinois, Michigan and Wisconsin form a cluster of Western States whose combined annual production of pig iron is now 28 per cent. of the total output of the country. As the nation's requirements have grown, these States have expanded their production, each recent year, in fact, having shown a slight gain over what had been the pre-

vious annual contribution. This expansion has been largely the result of better work by existing plants or by the substitution of improved furnaces for old ones, the number of entirely new works entering the field having been quite limited. This is forcibly shown by the following table, giving the number of furnace stacks in each of these States in condition for ore at the close of each of the past four years:

States.	1885.	1886.	1887.	1888.
Ohio.....	81	75	77	77
Indiana.....	2	2	2	2
Illinois.....	16	16	16	16
Michigan.....	27	26	27	27
Wisconsin.....	13	14	14	12
Total.....	139	133	136	134

Although a positive decrease in the number of furnace stacks is thus shown, the production of pig iron in these States, according to the statistics of the American Iron and Steel Association, has almost doubled in the same period. In 1885, which was, however, a year of depression, the output of pig iron was 1,056,327 net tons, and in 1888 it was 2,027,673 net tons. Prior to 1885, the largest production in any one year was in 1882, when 1,865,861 net tons were made. These Western States now turn out more pig iron than the whole country did in 1871, and very little under 1876. The heaviest gains have been made in Ohio and Illinois. The following table shows the progress made by each of these States since 1885:

States.	1885.	1886.	1887.	1888.
Net tons.	Net tons.	Net tons.	Net tons.	Net tons.
Ohio.....	553,933	903,094	975,599	1,103,818
Indiana..	6,634	16,660	13,211	15,390
Illinois...	827,977	501,795	565,453	579,307
Michigan.	143,121	190,734	213,543	213,251
Wisconsin	24,522	65,363	133,508	116,037
Total.	1,056,327	1,683,216	1,901,254	2,027,673

In 1885 these States made 24 per cent. of the total pig-iron production of the country; in 1886 they made 27 per cent., in 1887 they made 26 per cent., and in 1888 they made 28 per cent. Indiana contributed but a small amount, the State not being conspicuous as a producer of pig iron, despite its location within easy reach of Lake Superior ores and Connellsville or West Virginia coke. All the other States make a very good showing. The production in 1888 would undoubtedly have been considerably larger if the demand for steel rails had been as heavy as it was in 1887. Under the circumstances the gain made in the production of pig iron in 1888 over 1887 is quite remarkable, as in view of the lessened demand for steel rails a falling off in pig iron would not have been unnatural.

Should the present depression in the pig-iron trade continue for any length of time it is very probable that the production in these States will be curtailed, and that 1889 will witness a smaller output than that of 1888. The large majority of the plants are owned by companies in excellent financial condition, who will not sell their product below its actual cost, and who will blow out their furnaces when they have accumulated as much stock as they wish to carry. With them the restriction of production is not a matter of much difficulty, and does not entail embarrassment. But when their furnaces are blown out they will be repaired and perhaps remodeled and improved, and will be in shape to make a larger output than before when the demand revives. A number of new furnaces are also in course of erection, which will be ready for operations during the year, and whose influence

will be felt in the next period of activity, if not before it. The West will continue to be an important factor in supplying the pig-iron wants of the country.

State and Interstate Commerce.

When our United States Constitution was adopted there were long and sharp debates in the convention over very many of its provisions, but the section granting to Congress the power to regulate commerce between the States seems to have been passed without discussion. In the eighteenth century there was no commerce between the States which would now seem worthy of the name. Hence no need of dispute over a part of the Constitution which seemed precautionary rather than applicable to any existing danger. But how different now! Transportation of goods and passengers has become the greatest of our industries, the one wherein the acceptance of right or wrong principles affects the greatest number of our citizens. And since, by the decisions of our Supreme Court, the regulation of any thing or matter implies also the regulation of all the instrumentalities by and through which that thing or matter is carried on, we arrive at the powers and duties of Congress over the carriers of our goods and persons. But in theory the limit of this power is clearly defined. It concerns only such commerce as passes the boundary of a State.

All our early railroads may be said to have been built for local needs. A road was required from some port or city on a watercourse to some interior point, or to give some prominent place connection with canal or lake or river. The local Legislature granted a charter for the local work. It was purely a domestic matter with which other States had little concern. But later lines have not been chartered generally with so simple an end in view. What was before a local road becomes now a link in a vast chain in which many States and vast numbers of people are interested, and yet a local Legislature, by refusal of a local charter, may stop the carrying out of a vast system whose construction is a national necessity. Rigid State rights as far as local lines are concerned are well enough, but do they properly include the granting or refusing of charters to railways which, when completed, will be used almost wholly, or even partly as highways of interstate commerce? This is a new question in American political economy which before long may compel discussion.

Let us suppose the charter granted and the railroad built and running. The same distinction between State and interstate commerce, clear enough in theory, but impossible in practice, is disclosed. How shall the line be drawn? A Buffalo manufacturer selling in New York city and a Pittsburgh merchant, looking also for a market there, find no difference in trade, because the former's shipments need not leave the State, while the latter's must. No railroad official thinks of such imaginary lines as State boundaries in fixing competitive rates, while the traffic, which at first sight may seem free from this competition, will be found upon analysis to be subjected indirectly to the same relentless commercial rivalry in trade. Nothing can in the long run escape this. We also see the same cars, engines and tracks used for

State or interstate traffic indiscriminately, without any thought of theoretical differences; the same expenses are borne by both, the same officers manage both, the same stockholders earn dividends from both, and, what is of more consequence, the charges imposed upon the one kind must be the measure of the charges which can be collected from the other. In truth, then, it may be said that Federal and State regulation of railways are based on opposing theories. There is, and there must be, an "irrepressible conflict" between them. This will become more and more evident as our commercial conditions become more and more complex.

In what manner we can best solve this problem cannot be predicted. If we assume that never again will railroads be without some form of regulation by Government (and the present appearance of things gives that impression), we may also assume that the powers of the Federal Government may in the future be enlarged so as to include in some fashion the regulation of part at least of the traffic—and perhaps the charters—of roads now considered exclusively under State control. This would be centralization, it is true, but of the sort which could be defended. It might better be called an extension of the power of the Federal Government, required by the growth of the matter demanding supervision. A bridge across the Ohio River would require Congressional permission, but this once granted, neither Ohio nor Pennsylvania could obstruct the building, though each approach would be exclusively in one State or the other. So in railway traffic; what is necessary for the common good of many States should not be the exclusive property of any one of them.

Late Events in Mexico.

President Porfirio Diaz has been re-installed, after re-election on July 1 last, for another term of four years, much to the satisfaction of Mexicans generally and his numerous admirers abroad. During the past four years Mexico has made great strides in progress and improvement in pretty much all departments. A good share of it has been due to Diaz's personal initiative, wisdom and energy, but to a great extent also to the advisers who surround him. This capable cabinet has been retained. To a considerable degree the advancement of the sister republic has also been promoted by the large share which both American and European capital continues to take in developing the enormous resources possessed by Mexico. From a financial point of view the Mexican exchequer has been particularly clever and successful in consolidating the foreign debt at 40 per cent. through an agreement with British bondholders. Most of the outstanding bonds were old, dating from the time prior to Maximilian. Many of them were issued under circumstances which even the holders themselves must have admitted to be hard for the present generation to assume in full with accumulated interest. Hence the arrangement made about the sterling debt at the percentage named, and a moderate interest was willingly submitted to. This was at the time when Diaz had resumed power four years since. Order was brought into the chaos in which the Gonzalez admin-

istration had left the finances. Gradually the payment of subsidies to American railroads was resumed, the interest on the public debt began to be promptly paid, and finally, last year, the conversion at 40 per cent. was perfected through the floating of a 6 per cent. loan in Berlin, through the banking house of S. Bleichroder, to the amount of £10,500,000. The foreign debt of \$70,000,000 has in this manner been reduced to \$28,000,000, while the home debt, including the floating debt, does not exceed at present \$20,000,000. This is certainly a moderate indebtedness for a nation that has a population of 11,000,000. This population, it is true, is composed of some inferior elements, the whites not exceeding 19 per cent., while the pure Indians constitute 38 per cent. and the mixed races 43 per cent. But, with the exception of perhaps 10,000 wild Indians in Yucatan, the latter two classes are all peaceful and laborious. The majority are engaged in agriculture, while the silver mines employ 100,000. To suppress brigandage and repress revolutionary attempts, the Diaz administration has been precisely what Mexico wanted, robbers, railroad wreckers and traitors being summarily dealt with. The result is general quiet, protection to all, the return of confidence and increasing industry and trade.

On July 1 last 7500 km. of railroads were in operation, and there are quite a number of important projects of new lines to be carried out without unnecessary delay. The most important is the Inter-oceanic Railway, which is to link Vera Cruz to Acapulco. A new company has bought the 494 km. of finished sections, and has undertaken to supply the missing links. C. De Murrieta & Co., of London, did the financing in July last. Another important enterprise is the Sierra Mogada Railroad to be built by an American-European syndicate, originating at St. Louis, Mo. This line is to bring the San Felipe coal region in the State of Coahuila in communication with the Sierra Mogada mines, and is to join the Mexican Central at Ximenes in that State. This railway will be 400 miles long and will connect the Mexican National, the International and the Central by means of a track running from east to west. The City of Mexico has succeeded in floating a 7 per cent. loan for \$400,000 for the completion of the Tesquisquiac tunnel, which is to drain the City of Mexico. In September the new International and Mortgage Bank of Mexico went into existence through the purchase by American and European financiers of the Mortgage Bank of Mexico, which had been incorporated in April, 1882, and has been paying 9 per cent. dividend since. The authorized capital of the new bank is \$5,000,000. It is based on the charter obtained by its predecessor, in its turn based on the concession of the Crédit Foncier de France, the bank having the right to issue mortgage bonds or cédulas on real estate, which mortgages in no case can exceed 50 per cent. of the value of property mortgaged. The bank can issue mortgage bonds for ten times the amount of its capital. By the modifications granted mortgages can be extended to works of public improvement and general utility.

The Mexican army has an effective strength of 30,017 men, commanded by 1915 officers, while the navy consists of 5 gun-

boats. The postal service is attended to in 800 offices, and 724 minor branches, employing, altogether, 1528 men. The number of letters and postal cards handled in 1887 was 22,885,092 in the interior, together with 1,845,720 international letters. There were in operation last year 339 telegraph offices belonging to the Federal Government, the total length of lines of the latter being 21,458 km.; those of States, 6887; those of railroads, 6183; private lines, 4098; Mexican cable, 2926, constituting a grand total of 41,507 km.

The import of merchandise into Mexico in 1886 was \$38,715,000; the export of merchandise, \$13,741,316, and of silver, \$29,906,401; together, \$48,647,717. The export in 1887 was \$15,636,000 of merchandise and \$38,561,000 silver; together, \$40,197,000; the United States receiving \$12,007,000; England, \$2,397,000; France, \$717,000; Germany, \$891,000; Spain, \$409,000, and the other countries, \$125,000. Of the silver shipped, \$16,576,000 went to this country and \$11,122,000 to England. The products shipped were: Sisal hemp, \$3,901,000; coffee, \$2,627,000; hides and skins, \$2,211,000; cabinet and dyewoods, \$1,849,000; tobacco, \$851,000; vanilla, \$694,000; isle fiber, \$349,000; cattle, \$471,000; argentiferous lead, \$323,000; other merchandise, \$2,360,000; and silver as indicated above.

The American trade has been as follows:

Fiscal year.	import.	Domestic export to Mexico.
1886.....	\$17,329,889	\$9,242,158
1887.....	14,719,840	7,267,129
Increase..	\$2,610,049	\$1,975,059

There entered Mexican ports in 1887, 1240 sea-going vessels of a joint tonnage of 1,032,725, of which 653 steamers measuring 877,518 tons. The Mexican merchant marine consists of 421 sea-going vessels and 847 coasting craft.

The building of the Tehuantepec ship railway remains in abeyance till the company shall have succeeded in procuring the capital necessary for it. The parcel post between the United States and Mexico has proved a great blessing for both nations, and cannot fail to aid American trade in a most remarkable manner. From what precedes it will be perceived that everything goes on satisfactorily in Mexico and in connection with that country. There is, indeed, every prospect that from now forward our business relations with it will multiply and become established on a most satisfactory basis, whether a reciprocity treaty be concluded or not. Perhaps the incoming Administration will take in hand the latter, and thereby contribute its share toward the desideratum just alluded to.

Irregular Distribution of Silicon in Pig Iron.—In analyzing samples taken from every other bed of a cast of pig iron, Mr. J. W. Thomas finds the silicon to vary considerably, the iron coming first from the furnace having the highest percentage of silicon. The following are the silicon results, beginning with the first bed that is filled:

First Cast.	Second Cast.
First bed.....3.328	First bed.....2.021
Third bed.....2.058	Third bed.....1.732
Fifth bed.....1.890	Fifth bed.....1.741
Seventh bed.....1.800	Seventh bed.....1.765
Ninth bed.....1.834	Ninth bed.....1.722
Eleventh bed....1.834	Eleventh bed....1.783
	Thirteenth bed...1.853

The percentage of silicon varies in each pig, being higher at the point of the pig than at

the butt. This is shown by the following results:

	Point of pig.	Butt of same pig.
1.....	3.328	2.157
2.....	2.058	1.960
3.....	1.890	1.808
4.....	1.800	1.751
5.....	1.834	1.787

The data given above are from the last volume of the "Transactions" of the Iron and Steel Institute.

OBITUARY.

SAMUEL M. FELTON.

Mr. James M. Swank, Secretary of the American Iron and Steel Association, has published in the *Bulletin* a very interesting sketch of the life of Samuel M. Felton, from which we quote:

Very rapidly the men whose enterprise, courage and skill have built up during the past quarter of a century the iron and steel industries of this wonderful country, so that, to all intents and purposes, these industries are now the first in the world, are passing away. It was a remarkable era in our industrial history which produced these men, and they were themselves remarkable men. There were giants in those days. The list of those who have died within the past few years is a long one. Their places are being taken by young men. We trust that they will not forget to honor the memory of the pioneers, or to do full justice to their mighty achievements.

The last to pass away of the great men above referred to is Samuel M. Felton, the president of the Pennsylvania Steel Company since its organization in 1865. He died at his residence in Philadelphia on Thursday night, January 24, 1889, aged nearly 80 years. Mr. Felton had been in poor health for several months, owing to the weight of years, but it was not until about a month ago that his condition became alarming. Thenceforward his strength gradually failed until the end. He was buried in Woodland Cemetery, on Monday, January 28.

Samuel Morse Felton, civil engineer, was born in West Newbury, Mass., July 17, 1809, was graduated at Harvard in 1834, studied civil engineering, became superintendent and engineer of the Fitchburg Railroad in 1843, and left it in 1851 to become the president of the Philadelphia, Wilmington and Baltimore Railroad Company, which position he occupied until 1865, when he resigned, owing to the great strain which its arduous labors and great responsibilities had imposed on him during the war.

The Pennsylvania Steel Company, of which Mr. Felton was the president from its organization in 1865, was the first company in this country to make the manufacture of Bessemer steel rails a commercial success. This was in 1867. The late J. Edgar Thomson, the president of the Pennsylvania Railroad Company, and Mr. Felton were the leading spirits in its organization and the principal subscribers to its stock. It required great courage to risk what they risked.

Mr. Felton was a commissioner of the Hoosac Tunnel in 1862, and a Government commissioner of the Union and Central Pacific Railroads in 1869. He was a member of the Centennial Board of Finance, and a director of the Northern Pacific Railroad Company from 1870 to 1873, and of the Pennsylvania Railroad Company from 1873 to 1883. He was also one of the original members of the Union League of Philadelphia, and occupied various other positions of honor and usefulness.

From authentic resources the *Bulletin* of the American Iron and Steel Association has compiled the following detailed account of Mr. Felton's services to the loyal

cause during the civil war: As president of the Philadelphia, Wilmington and Baltimore Railroad Mr. Felton planned and directed the secret passage of Mr. Lincoln from Philadelphia to Washington previous to his inauguration as President in 1861. He received information that a deep-laid plot existed to seize the Capital with its archives and records, and then declare the Southern conspirators to be the Government *de facto* of the United States. At the same time all communication between Washington and the North by way of the Philadelphia, Wilmington and Baltimore Railroad was to be cut off by burning the railroad bridges. If Mr. Lincoln was found he was to be put out of the way. Mr. Felton organized and armed a force of trained men, who, while apparently whitewashing the bridges, were in reality a guard that could be summoned instantly. He also established a secret police force.

The advertised route of Mr. Lincoln was from Harrisburg to Washington by way of the Northern Central Railroad. Mr. Felton secretly changed this plan and sent Mr. Lincoln from Philadelphia to Washington by delaying a regular train on his road for the nominal purpose of forwarding an "important package." When Mr. Lincoln was safely on the train the telegraph wires in all directions between Harrisburg, Philadelphia, and Washington were cut, and not united again until 8 o'clock on the following morning. After they were joined the first message announced the safe arrival of the "important package." The package was merely a bundle of old reports, carefully sealed and directed, and sent by special messenger, but its arrival meant the arrival of Mr. Lincoln at the Capitol. To Mr. Felton's alertness and good management this happy termination of Mr. Lincoln's perilous journey to Washington was entirely due.

The opening of the Annapolis route to Washington in 1861, as the result of Mr. Felton's foresight, was a service of great importance to the country. As early as December, 1860, he warned General Scott of the danger that menaced the Philadelphia, Wilmington and Baltimore Railroad by the destruction of its bridges over the Gunpowder and Bush rivers, near Baltimore, and urged him to provide against it by adopting the alternative route by way of Annapolis. When the news of the riot in Baltimore, on the 19th of April, 1861, and the burning of his bridges reached Mr. Felton by telegraph, even while the conflict was in progress, he instantly prepared to carry into execution the plan he had previously formed of using the iron ferryboat Maryland, employed on the Susquehanna ferry, to transport troops from Perryville to Annapolis, and thus open a new route to Washington. To this end he telegraphed to Washington for orders to send troops to Annapolis, but the authorities there urged him to forward troops to Baltimore. He was thus thrown on his own resources, and was obliged not only to organize the work of transportation by way of Annapolis, but to charter vessels and to convince the commanders of the various regiments arriving in Philadelphia of the necessity for a change of route. He took the sole responsibility of adopting a new route.

Almost simultaneously with the burning of bridges on the Philadelphia, Wilmington and Baltimore and the Northern Central railroads, Virginia troops to the number of several thousand seized Harper's Ferry, thus controlling another important direct route to Washington. With Baltimore in arms, and the Potomac closed by rebel batteries, Washington was in grave and imminent peril. In all probability the Capital would then have fallen but for the vigilance, foresight and energy shown by Mr. Felton in hurrying troops to Washington by way of Annapolis.

Not only did Mr. Felton direct in every detail the management of the Philadelphia, Wilmington and Baltimore Railroad at this time, but he prepared plans for the consolidation of all the railroads centering in Philadelphia, the telegraph and the Adams Express Company, and their employment as a unit in the service of the Government. In all that Mr. Felton did he was most ably and vigorously seconded by Mr. J. Edgar Thomson and by Admiral Dupont, then commanding the Philadelphia Navy Yard. From the morning of April 18 until after 6 o'clock on the evening of the 20th he scarcely allowed himself time to eat and did not close his eyes in sleep.

The authority for these statements is to be found in the official records of the war, the telegraphic dispatches sent by Mr. Felton, other documents relating to these events, which will soon be deposited with the Pennsylvania Historical Society, and in a narrative written by Mr. Felton, portions of which were printed in Schouler's "Massachusetts in the Civil War." The service to the country rendered by Mr. Felton was of the utmost importance, and it was given with all the determination and unhesitating assumption of responsibility that the crisis demanded. The result of the adoption of the Annapolis route in saving Washington is a matter of history, but the details have never been generally understood.

GUIDO PFISTER.

Guido Pfister, of Milwaukee, Wis., died on the 2d inst., after an illness of two weeks. Mr. Pfister was one of Milwaukee's foremost and wealthiest citizens. He was born at Hechingen, in the principality of Hohenzollern, Lower Germany, in 1818. He went to Milwaukee in 1847, when 29 years old, and immediately established himself in the leather business. The firm of Guido Pfister & Co., was formed in 1853. In 1857 Messrs. Pfister and Vogel merged their interests and proceeded to build up the enormous business now conducted by the Pfister & Vogel Leather Company, incorporated 1872, and of which Mr. Pfister was president. The company do the largest business of the kind in Milwaukee, and occupy first rank among the leather manufacturers of the country. Mr. Pfister's business interests were remarkably extensive. Compared with the aggregate of his other holdings, his interest in the Pfister & Vogel Leather Company was really small. He was one of the principal owners of the Milwaukee and Northern Railroad, and he was largely interested in the North Chicago Rolling Mill Company. He was a member and director of the Northwestern National Insurance Company, the Northwestern Mutual Life Insurance Company, the Merchants' Bank and the Mechanics' Fire Insurance Company. He held stock in the Wisconsin Telephone Company, in the Metropolitan Land and Iron Company, who operate the Norrie Mine, and was vice-president of the Johnson Electric Service Company. He owned a great deal of real estate in Milwaukee, especially in the Kinnickinnic and Menominee valleys. At an early day he invested a great deal of money in lands in Northern Michigan and Northern Wisconsin, and at the time of his death he owned many thousand acres in those regions. Much of the land is located along the line of the Milwaukee and Northern Railroad. He was a member of the Chamber of Commerce and Merchants' Association. In his charitable deeds he was extremely unostentatious. The Little Sisters of the Poor are said to have been largely supported by him. For ten years past he had entirely maintained an asylum for the aged poor near his birthplace; he set aside quite a large sum for the purpose, and the interest is used to maintain

the institution. There are two or three other charitable institutions on the other side of the ocean to which Mr. Pfister made regular contributions.

CORRESPONDENCE.

The Economy of Heating Furnaces.

To the Editor.—In your issue of the 17th inst., alongside of my letter of the 9th, is a reply from Messrs. Alexander Laughlin & Co. On the last line of my letter there is a slight error, namely: "product per ton" should read "product per turn." To properly decide which is the best of any two given systems of heating for any given person or persons to employ, all the circumstances attending each system must be well considered; the one having the balance in its favor will be, of course, considered the best.

Upon comparing the regenerative gas-heating furnace with an ordinary well-managed coal-fired heating furnace the following points present themselves for consideration, namely:

1. The kind of work to be done.
2. Constant or intermittent.
3. Locality where furnace is to be erected (price of coal).
4. Total amount of coal strictly on account of heating.
5. Cost of labor operating furnace.
6. Waste, or loss by oxidation.
7. Product.
8. Repairs.
9. Quality of work turned out.

Now, after some two and a half years' experience with a regenerative gas-heating furnace, built originally to Mr. Smith's plans, but since slightly altered, and for the purpose used (that of heating bar iron for an 18 inch train) we can safely say that, considering all the points enumerated, and comparing with the old style furnace, there is, in our case, an advantage in using the gas furnace; but that this advantage is not so great as would appear to be the case with others. As may be gathered from the tone of my last letter, others seem to get along with very much less coal than we do. But let us see if there is not a mistake somewhere. I do not agree with Messrs. Laughlin that a manufacturer would consider that the coal used on any kind of furnace for heating would be that used in "actual working hours" only; for, if he did not figure on all the coal weighed to the furnace over a period and divide by the 2240-pound tons made in the same period he would soon find that he was running behind. Nor do I agree with these gentlemen that 2000 pounds is a ton of finished iron. Manufacturers sell and dealers buy by the 2240-pound ton, and all tonnage labor is paid by the same ton. Again, one of the disadvantages in using a regenerative gas heating furnace on single turns only is that *proportionately* more coal is needed to keep up over night and get hot for next day's work than is needed on a well-managed coal-fired furnace, capacity considered. This is not to be wondered at when one considers the large amount of heating surface of the regenerators, which must be kept to their heat for efficient work. Now, let us allow that 255 pounds of coal was used to 2000 pounds of finished iron, though the amount of coal used was got at in rather a crude way—by counting the hoppers, as would appear from the statement given on the 8d inst. If 255 pounds were used for 2000 pounds of iron, 285 pounds would be used for 2240 pounds, or one ton; and if we add 115 pounds more per ton for keeping up, getting hot, and heating up Sundays for Monday's work, we have 400 pounds per ton of iron heated. I do not think 115 pounds per ton for this work too high,

amounting, as it does in the case referred to, to 1874 pounds per night on the average, and this average includes coal burned Sundays.

As hinted by Messrs. Laughlin, the amount of coal used is governed largely by the amount of the product. This is probably often overlooked. But with us, as at Zanesville, the product is bar iron, and we, of course, cannot get so large a product on that class of work as we could on nail-plate for instance, although we cannot blame the furnace or the rolls for it. Again, on nail-plate, the crop ends are proportionally smaller than on bar iron; thus, again, we see that item 1 should be well considered. Your correspondents refer to the consumption of coal for heating for a 9-inch mill, single turns, all told 400 pounds per ton. If by this is meant net tons, figured on gross tons it would appear as 448 pounds per ton—quite a difference. I think, too, it will be allowed by all that the consumption should be quite small for iron heated for a 9-inch mill, on account of the piles or billets being small and rapidly heated, compared with the larger piles heated and rolled on larger mills as at Zanesville and others. Here item 1 is again considered.

On a modified coal-fired furnace, heating for a 10-inch mill, we have for a week (double turn) heated a gross ton of finished iron with 560 pounds of Cumberland coal, all the coal being weighed, and made steam in large quantity with the waste heat. The product in this case was 9 to 10 gross tons per shift, and the waste by oxidation 6 per cent. The product was rounds, flats, &c., as usually rolled on this sized train.

I have figures from several sources, showing the coal consumption over a period on gas-heating furnaces, but even with those running double turn, and on nail slabs (steel) they do not claim to do upon the average anything like 300 pounds per gross ton of finished iron. It is right to say, though, that these furnaces have not been constructed recently, some being three to five years old. I think it would hardly be doing justice to Mr. Smith (who is entitled to great credit for having so energetically pushed the regenerative furnace in the United States) to at present say how much coal per gross ton we are using for heating, because I have reason to think that the furnaces he is now constructing are much improved since the time he furnished the plans for ours. If this correspondence should be the means of showing (by the replies elicited) how we can reduce our coal consumption I shall only be too glad to apply the remedy here, where coal costs "something."

I did not refer to the question of oxidation in my former letter, because we were well satisfied on that point. In fact, coal consumption is at present our weakest point. We have, I may say, heated heavy iron piles with a total loss of 4.5 per cent. in the gas furnace. The amount of coal needed to make steam (which is made from the waste heat on the coal-fired furnace system) must be added to the coal used on the gas furnace, capacity considered, to get total consumption, and is no small item where coal is expensive.

Yours respectfully, S. PETERS.

PORTLAND, ME., January 28, 1889.

To the Editor: In connection with the recently published correspondence relating to the economical work of the Smith Gas Furnace at Zanesville, Ohio, I beg to submit the following: Suppose two (2) coal heating furnaces are working to a 16-inch train, having boilers overhead generating steam sufficient for power, is the less fuel consumption in their gas furnace sufficient to equalize the coal consumed in separate boiler for power, and also pay the wages

of man on the producer? The above comparison seems to me the only proper one to make, at least for the question of coal consumption, even though the difference in loss from oxidation will serve as an offset to a certain percentage.

W. G. MORGAN,
Phoenix Horse Shoe Company.
POUGHKEEPSIE, N. Y., January 25, 1889.

Demurrage Charges at Chicago.

To the Editor: In your issue of January 31 is an article on railroad demurrage charges at Chicago. In any general discussion of this subject one material point is often overlooked, and was not mentioned in your editorial. It is this: If delay is a commercial offense, and as such to be paid for, then delays on railroads should be included. In Germany the law distinctly allows the railways to charge demurrage for overtime, but it as distinctly allows the merchant to collect compensatory damages for every day's delay to goods under shipment beyond a maximum time fixed for terminals, and one day for every so many miles of distance. If this fixed limit is passed by 15 days the railroad must pay for the goods, then technically considered lost.

T. L. G.

NEW YORK, February 1, 1889.

Washington News.

(From Our Regular Correspondent.)

WASHINGTON, D. C., February 5, 1889

The Committee on Ways and Means held another meeting to-day, during which they continued the reading of the Senate substitute. The Republican members of the committee are giving very little attention to this preliminary form, as any opposition on their part would simply cause delay without accomplishing anything. To-day Mr. Breckenridge, of Arkansas, made a motion to strike out the sugar clause, which led to some discussion between the majority and the two Republican members present, which consumed a large share of the time and lasted until adjournment. It is now conceded by Sub-Committee Chairman Allison on the one hand, and Chairman Mills on the other, that neither the House bill nor the Senate substitute can pass. A new idea has been suggested on the part of the Democratic leaders of the House in the shape of a selection of such features of the Senate substitute as come within range of the House bill, and upon that to build up a compromise measure. The only features which would come within that range are:

1. Repeal of the tobacco tax.
2. Repeal of tax on alcohol used in the arts.
3. Adoption of the administrative features.

This would relieve the redundant revenues of about \$30,000,000. The committee will not agree to any of the customs features of the Senate substitute. The Ways and Means Committee have not yet received the figures from the Treasury Department which will exhibit the operations of the Senate substitute, and they are unwilling to proceed until they can have that information, in order to know what they are doing. The members say that otherwise they would be groping about in the dark.

As this Congress will terminate by limitation in another month, the tobacco and protection Democrats have notified the Committee on Ways and Means that they will give them a reasonable time to report, but if not heard from very soon they will move ahead on their line, following the leadership of Mr. Randall. If the tariff controversy in the House should reach this point the contest will be inter-

esting. The tobacco wing under Randall will be supporting tobacco tax repeal, while the tariff reform wing will stand out for customs reduction. The Republicans meanwhile will support their Senate substitute. With these clashing interests and opinions complicating the issue the prospects of doing anything by this Congress are not bright.

There is a powerful influence in both Houses which is opposed to urging an extra session on the grounds of tariff revision. The surplus bugbear has lost much of its force. The increased pension allowances and an enormous deficiency in the appropriations for pensions under existing statutes alone gives rise to some doubt as to the expediency of endangering the financial status of the government by any material reduction of revenues. The possibility of large appropriations to meet any sudden emergency in the Samoan situation is another check to revenue-reducing legislation.

Taking all these things together, the more conservative members of both Houses of Congress think that a session before the regular time would be unwise, unless Samoan complications should compel a declaration of war with Germany, or require legislation to give the President additional authority.

There is considerable agitation in political circles growing out of the mention of the name of Senator Evarts for Secretary of the Treasury. Senator Allison and others of equal weight in Republican counsels think that this would be a satisfactory way out of the New York dilemma. The venerable Senator, however, is not disposed to view the situation in that way. He is very well satisfied where he is.

The warlike flurry in the South Sea islands has stimulated a decided disposition to increase the appropriations for ships and guns. It is proposed, when the Naval Appropriation bill reaches the Senate, to add large items for the building of ships and construction of ordnance. Members of the Senate Sub-Committee on Finance, speaking of the changed condition of things which may be imminent, and the prospective increased necessities of the Government, are inclined to regard the delay in the passage of measures proposing a reduction of revenue as rather a fortunate circumstance. With legislation putting a protective duty on tin plate, and specifically determining the duties upon and classification of cotton ties and wire rods, they would be satisfied to allow matters to rest, while the proposition in the House to prepare a composite bill, making a reduction in the revenues which might be regarded as experimental, would enable the ultra men who train after Chairman Mills to reclaim some of the ground lost during the heated tariff contests of the last campaign.

The Bethlehem Iron Works, at Bethlehem, Pa., will soon make their first delivery of steel forgings for large guns, under their contract with the Navy Department. The company have erected a new plant at an expense of \$1,000,000, and will soon be able to keep the Ordnance Foundry at Washington supplied with forgings for 6, 8, 10, and 12 inch guns. The foundry has used up about all the material on hand, and will be ready to go to work on the forgings as soon as they are delivered. The first 8-inch material received will be used for the two 8-inch guns for the new cruiser Charleston at San Francisco. The four 6-inch guns for the gunboat Petrel are now being finished at the foundry, and will be ready for shipment when that vessel is completed.

An iron shed 600 feet long will be erected in Hoboken for the Delaware, Lackawanna and Western Railroad.

The Threatened Coke Strike.

From present appearances the threatened strike of the coke workers in the Connellsville coke region will not become general. Notwithstanding the fact that at a number of the works in the region the men have gone out, a sufficient number are still at work to more than supply the demand for coke, which for the past two months has been on the decline. In fact, so great has been the falling off that very few ovens in the region are being operated more than four days per week. In view of these circumstances the operators feel that an entire shut-down of all the ovens in the region for a period of several months would be in the nature of a blessing, and for this reason they are indifferent, to an extent, as to whether the men continue at work or not. The report published in the Pittsburgh papers last week that the H. C. Frick Coke Company had signed the scale is without foundation. On Thursday, the 31st ult., this firm posted a notice on their various works that present wages would be continued until otherwise ordered, but did not sign the scale. This firm are paying 6½ per cent. more wages than is paid at the other works in the region. Some time ago the workers outside of those employed by the Frick Company prepared a scale, which is practically the same as that now in force at the Frick Works, and announced that unless all other operators in the region signed it before February 1 there would be a strike. The men claimed that if the Frick Company could afford to pay the wages asked for by this scale, the other operators could do so. On the other hand, the operators state that the Frick Company are able to pay higher wages from the fact that they have a number of old contracts on hand, some of which are based on coke at \$1.50 per ton. As is probably well known, the H. C. Frick Coke Company are closely related to the firms of Carnegie, Phipps & Co., Limited, and Carnegie Bros. & Co., Limited, and the greater part of the coke produced by the Frick Company is used in the nine blast furnaces operated by the above-named firms. Had the Frick concern decided to stand with the other firms, and refused to continue the present rate of wages, it is probable that a general strike of the coke workers would have been the result, and in a short time the Carnegie firms would have been unable to procure coke to operate their blast furnaces, and, as a consequence, they decided to authorize H. C. Frick, who occupies the position of chairman of the H. C. Frick Coke Company, and also Carnegie, Phipps & Co., Limited, to continue to pay the wages called for by the Frick scale, which expired on the 31st ult. A majority of the operators in the region have expressed themselves as being willing to continue present wages, but they will not concede any advance. They further state that should an advance in the price of coke occur, they will be willing to take the question of an advance in wages into consideration. It is believed that the close of the present week will witness a resumption of work at the few works now idle, and also a settlement of the threatened trouble.

The prices for furnishing iron water-pipe to the city of Milwaukee by the Addyston Pipe and Steel Company (the lowest bidders) were: 30-inch, \$24.75; 16, 12, 8 and 6 inch, each \$24.93; 4 and 3-inch, \$25.93 each.

The Edison Iron Concentrating Company, of Chicago, have been incorporated under the laws of Illinois, with a capital of \$115,000, to carry on a general mining business. The incorporators are Walter S. Mallory, Justin B. Stanley and Jeremiah Leaming.

TRADE REPORT.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St.,
PHILADELPHIA, Pa., February 5, 1889.

Pig Iron.—The market shows but little change from the condition reported a week ago. Prices may possibly be a trifle steadier, but there is no life or activity in the market, and nothing to warrant very strong hopes of such a turn in the immediate future. A bottom appears to have been reached, however, and at, say, \$15 delivered for Gray Forge, \$16.50 for No. 2 and \$17.50 @ \$18 for No. 1 there is not only no disposition to make concessions, but there are very few willing to accept those figures, even from the very best class of buyers. Some orders were placed at those prices recently, but the more necessitous sellers appear to have unloaded, so that the market stands more on its merits than it did a week or two ago. Fair average quotations to-day would be \$15.50 @ \$16, delivered, for Gray Forge, \$16.50 @ \$17 for No. 2 Foundry, and \$18 @ \$18.50 for No. 1. Some brands command a little beyond these figures, while others, under special circumstances, might not command as much; all depends on circumstances. A careful review of the entire position would lead to the impression that, notwithstanding the dullness, there are some indications of improvement. There is, for instance, less disposition to force sales. Makers of Pig Iron appear to have concluded that they may as well call a halt at present prices, and if the iron cannot be placed the furnaces will be "blown out." This feeling is so universal that even consumers begin to see that there is no danger in taking good Iron at current rates, although such a thing as an advance is hardly taken into account. There is a very careful discrimination, however, in regard to the selection of brands, and while one, such as consumers might have a preference for, would command the highest quotation, others might be neglected at comparatively very low figures. The market is well enough supplied to permit plenty of choice to the buyer, and for the same reason it is very difficult to place Irons that are not fully established. As regards this market, we repeat that while there is very little change from last week, the position is so sensitive that it would be easily influenced by advices from the South and West. Buyers and sellers therefore both seem inclined to wait developments before entering into heavy engagements, the general impression being that the demand will improve during the current month, and prices be somewhat more settled than they were during January.

Foreign Iron.—Bessemer nominal at \$19.50 @ \$20, c.i.f., duty paid, and 20 % Spiegel \$27.50 @ \$28, with no demand at these rates.

Blooms.—The market is dull and irregular, although sales appear to be at about the figures quoted below—viz.: \$28 @ \$28.50 at mill for Nail Slabs; \$29 @ \$30 for Sheet Iron Billets; \$30 @ \$31 for Soft Tank, and \$35 @ \$36 for flange purposes; Charcoal Blooms, \$52 @ \$54; Run-out Anthracite, \$42 @ \$44; Scrap Blooms, \$32.50 @ \$34 @ "bloom" ton of 2464 lb.

Muck Bars.—There is rather more inquiry, but the outcome has not amounted to much actual business so far. Prices at mill are from \$27 to \$27.50 asked, or \$28 to \$28.50 delivered; but buyers talk materially lower figures before they can do anything.

Bar Iron.—There is not much room for comment under this heading. Manufacturers say they are refusing orders

daily because prices are too low to cover first cost for a good quality of Iron. Somebody takes the business, however, but whether the quality stipulated for is delivered is another thing. A good deal of business of this kind is taken at \$1.70 @ \$1.75 for specifications, which leading mills claim they could not meet at less than \$1.80 @ \$1.85. This is the talk among manufacturers, and is said to be the only reasonable explanation that can be given for such low prices. But in any case the volume of business is not large, otherwise cutting would be less frequent. Skelp Iron is moving at about \$1.75 for grooved, although the demand is confined to one or two large concerns, who have taken it in 1000-ton lots. The general tone of the market is called fairly active, but at weak and irregular prices for both Bars and Skelp.

Plate and Tank Iron.—Business continues dull, without the slightest indication of an early improvement in price. The volume of business is by no means small, but the immense capacity for production keeps many of the mills in a chronic condition of hunger. The large Steel works West are the most serious competitors, and, until there is a better demand in that section of country, the East will have to continue doing business at low prices, which, to-day are about as follows: 1.90¢ @ 2¢ for Ordinary Plates and Tank Plates, 2.1¢ @ 2.2¢ for Universal Plates; Shell, 2.4¢ @ 2.5¢; Flange, 3.5¢; Fire-Box, 4¢; Steel Plates, Tank and Ship Plate, 2.15¢ @ 2.25¢; Shell, 2.7¢; Flange, 3¢ @ 3½¢; Fire-Box, 3½¢ @ 4½¢.

Structural Iron.—A little more activity may be noted in this department, although no very large orders have been placed. The general demand is better, however, and some of the mills have gained a little, without being at all crowded with work. Prices are still very much unsettled, with something of a tendency toward lower prices on Plates and Angles. Nominal quotations as follows: Bridge Plate, 2¢ @ 2.1¢; Angles, 2¢ @ 2.1¢; Tees, 2.4¢ @ 2.6¢; Beams and Channels, 2.8¢ for Iron or Steel.

Sheet Iron.—A better demand is reported, and a large amount of business could be taken at prices slightly below quoted rates. Manufacturers consider that current prices are already lower than they ought to be, and are not disposed to meet buyers' terms for first-class qualities. Small lots are quoted as follows:

Best Refined, Nos. 26, 27 and 28.....	3 @ 3½¢
Best Refined, Nos. 18 to 25.....	2½ @ 3¢
Common, ¼¢ less than the above.	
Best Bloom Sheets, Nos. 26 to 28.....	4½ @ 4½¢
Best Bloom Sheets, Nos. 22 to 25.....	3½ @ 4¢
Best Bloom Sheets, Nos. 16 to 21.....	3½ @ 3½¢
Blue Annealed.....	2.6 @ 2.8¢
Best Bloom, Galvanized, discount.....	62½¢
Common, discount.....	67½¢

Steel Rails.—The market is not active by any means, but there is a fair inquiry and some sales at quoted rates, including one 5000-ton lot for March and April delivery at \$28, f.o.b. cars, Eastern mill. Report says that relatively lower prices have been accepted in the West, but there is an undoubtedly firm feeling in this market, and \$28 is said to be a minimum quotation.

Old Rails.—Nothing doing in this market, the lots here being held at upward of \$24 in store. There are buyers at \$23.50, f.o.b. cars, with one sale of 1000 tons at that price, f.o.b. cars Jersey City.

Scrap Iron.—Market quiet and easy, although quotations remain as before, viz.: \$20.50 @ \$21 for cargo lots; \$21.50 @ \$22 for carload lots, delivered, or for choice \$22.50; No. 2 do., \$14 @ \$15; Turnings, \$13 @ \$14; Old Steel Rails, \$20 @ \$21; Cast Scrap, \$15 @ \$16; do. Borings, \$9 @ \$10; Old Fish Plates, \$25 @ \$26; Old Car-Wheels, \$17 @ \$18, Philadelphia.

Wrought-Iron Pipe.—Considering that this is the dull season, the demand is very fair. There are two or three inquiries in the market for very large lots, and manufacturers expect that a great deal of work will be given out this spring. Meanwhile the smaller class of trade are supplied at about the following discounts: Butt-Welded Black, 55 %; Lap-Welded Black, 65 %; Butt-Welded Galvanized, 45 %; Lap-Welded Galvanized, 55 %; Boiler Tubes, 62½ %.

Nails.—The market is dull and unchanged. Standard brands command \$1.90 @ \$2 from store, but outside Nails are irregular and hard to move in large lots, unless at concessions from quoted rates. Manufacturers are still hopeful that united action will be taken with a view of restricting production and advancing rates to fair living prices.

Chicago.

Office of *The Iron Age*, 95 and 97 Washing-
ton street, CHICAGO, February 4, 1889.

Now that the month of January has passed, it is interesting to note how different the course of the Iron trade has been from that anticipated quite generally during the dullness of December. Predictions were then freely made that "the turn of the year" would bring better business, and that the middle of January, at the furthest, would see a resumption of activity and decided firmness in prices. Instead of this the greater part of the month was exceedingly dull, buying was spasmodic, prices gave way, and February opens with a cheerless aspect. Coke Pig Iron has fallen from \$1 to \$1.50 @ ton, Bar Iron shows fully as great a shrinkage, Tank Iron and Steel have lost \$3 @ ton, Tool Steel is ¼¢ @ lb lower, Old Rails are \$2 @ \$2.50 @ ton cheaper, and the demand for Scrap has not been so light at this season for years. The cut of ¼¢ @ lb in Beams and Channels, though brought about by special influences, emphasizes the prevailing tendency toward lower prices. Steel Rails held their own during the month, as did Steel Nails, but these commodities had sounded the lowest depths of depression in the fall, and their exceptional position of firmness in the midst of general weakness is due to the appreciation of remedial measures found necessary by the manufacturers to avert complete demoralization. The time has evidently not yet come for the adoption of similar measures in other branches of trade, which are now drifting in a sea of uncertainty, with no beacon light to indicate where a haven is to be found. In agreeable contrast with the unsatisfactory condition of the primary branches of the Iron trade, the Hardware merchants are enjoying an excellent demand for all classes of goods.

Pig Iron.—Dealers report a little more activity during the past week, but nothing has occurred to show any special tendency in the market. Those who need Iron are buying it, and those who do not need it are not inclined to speculate. The low prices now current are not being met by all manufacturers, and it is noticeable that those who are willing to do so seem to have no trouble in disposing of as much of their product as they care to sell. Some of the largest Southern furnace companies are reported to have withdrawn from the market, with contracts covering their entire production for a considerable part of the year, which causes a restriction on the supply of Mill grades. In Lake Superior Charcoal no change has been made, moderate sales being reported at full prices. Cash quotations are as follows, f.o.b. Chicago: Lake Superior Charcoal, Nos. 1, 2 and 3, \$20; American Scotch (Blackband), No. 1, \$18.50 @

19.50; No. 2, \$17.50; Jackson County Silvery, No. 1, \$18; other Ohio Soft Irons, No. 1, \$17 @ \$18; Lake Superior Coke, No. 1, \$16 @ \$17; No. 2, \$15 @ \$16; No. 3, \$14 @ \$15; Southern Coke, No. 1 Foundry, \$16 @ \$16.50; No. 2 Foundry and No. 1 Soft, \$15.25 @ \$15.75; No. 3 Foundry, \$15; Gray Forge and No. 2 Soft, \$14 @ \$14.50; A reduction of 15¢ per ton was made on the 1st inst. in the rate of freight on Pig Iron from the South.

Bar Iron.—With a limited demand nominal quotations are still maintained at 1.70¢, half extras, f.o.b. Chicago, for mill lots of good Common Iron. Close figuring is done on good specifications, each transaction carrying its own price, which is seldom made public, unsuccessful bidders not knowing how much they were beaten. The market is unsettled from this cause, and an attempt to give actual prices would be a mere piece of guesswork. Jobbers report a very light demand from the small manufacturing consumers, showing a dearth of business among them. Quotations from store vary from 1.90¢ to 2¢, according to quantity and quality.

Structural Iron.—There is nothing of interest to report, and prices are nominally unchanged. Mill lots are quoted, f.o.b. Chicago, as follows: Angles and Sheared Plates, 2.12½¢ @ 2.15¢; Universal Plates, 2.20¢; Tees, 2.45¢ @ 2.55¢; Beams and Channels, 2.90¢; Small lots from store are held at the following rates: Angles, 2.25¢; Tees, 2.70¢; Beams and Channels, 3.50¢.

Plates, Tubes, &c.—Much more than the usual volume of business has been done in Plates, in consequence of the closing of contracts for large quantities upon which bidding has been in progress for some time. As the competition was very strong the prices made were very low. One order taken was for 420 tons of Tank Steel to be used in the construction of the new water works. There was a difference of over \$25 per ton between the highest and lowest bids. Small lots from store are quoted as follows: Sheet Iron, Nos. 10 to 14, 2.50¢; Sheet Steel, 3¢ @ 3.50¢; Tank Iron, 2.40¢; Tank Steel, 2.60¢ @ 2.75¢; Shell Iron, 3¢; Shell Steel, 3.12½¢; Flange Iron, 4¢; Flange Steel, 3.50¢; Fire-Box Steel, 4.75¢ @ 5.75¢; Boiler Rivets, 4¢ @ 4.25¢; Ulster Iron, 3.75¢. Boiler Tubes, 62½¢ @ 65¢ off.

Sheet Iron.—No change is reported of any consequence, except that manufacturers' prices for Galvanized are slightly firmer and for Black Sheets a little weaker. Prices from store continue at 3.30¢ for No. 27 Common Black, and 65¢ off for Juniata Galvanized and 65¢ and 2½¢ off for Charcoal.

Merchant Steel.—The volume of business is small at present, with buyers shopping vigorously before placing their orders. Quotations are as follows: Bessemer Bars, 2.30¢; Tool Steel, 7½¢ @ 8¢; Specials, 13¢ @ 25¢; Crucible Spring, 8.75¢; Open-Hearth Spring, 2.25¢ @ 2.50¢; Open-Hearth Machinery, 2.30¢ @ 2.40¢; Tire, 2.25¢ @ 2.50¢; Sheet, 7¢ @ 10¢.

Steel Rails.—A number of small lots were sold during the week, but orders for any considerable quantity are scarce. Prices are asked by some of the leading railroad companies, and it is expected that they will want large lots, but they do not state what they will need nor how much they expect to contract for at this time. Prices are firm at \$30 @ \$30.50, according to quantity.

Old Rails and Wheels.—Several thousand tons of Old Iron Rails have been sold at various prices, ranging from \$21.50 to \$20. The drop in prices induced rather free buying, but consumers now seem to be well stocked, and probably not over \$19.50 could be realized. Old Car Wheels

are very quiet and are nominally worth \$19. Old Steel Rails are quoted at \$14.50 @ \$17.50, according to length.

Scrap.—There is no demand at present. Dealers say that not for years has the market been so dull at this season. Midwinter usually brings an active demand for Scrap, but this has been an exceptional winter in almost every respect. In the absence of transactions, prices are wholly nominal for most classes of old material. Mixed Steel was sold at \$16.75, gross ton, delivered at Pittsburgh, and Heavy Cast Iron at \$13.60, net ton, Chicago. Some Axle Chips sold at \$12.50, net ton, Chicago.

General Hardware.—In this line business is going on very satisfactorily, and the outlook is most promising. Agricultural commodities, such as Steel Goods and other articles used by farmers, are in active request, while staple goods, and particularly Builders' Hardware, are moving freely. An indication of the condition of affairs in the Northwest is shown by the activity in the local building trade, more permits for buildings having been issued in this city in January than in the corresponding month in any of the past five years. Collections are excellent for the season.

Nails.—The advanced card adopted by the manufacturers of Steel Nails last week was immediately followed by an advance of 5¢ per keg by the local jobbers. The price here is now \$2 in carloads or mixed carloads, and \$2.05 in small lots. Wire Nails are a little weaker, notwithstanding the efforts of manufacturers to stiffen the prices of these goods. Small lots are now quoted in a regular way at \$2.45, with 5¢ off for carloads or mixed carloads. Both kinds of Nails are selling very freely from stock, but comparatively few straight carloads of either are now called for, such orders being for mixed lots, usually half and half, with a slight preponderance in favor of Steel Cut Nails.

Barb Wire.—Nothing new has occurred in this branch of trade. The demand continues exceptionally good for the season, stimulated, doubtless, by the mild weather, which enables farmers to do more outdoor work than usual, but prices are no higher. Jobbers quote 2.80¢ for Painted and 3.40¢ for Galvanized in mixed carloads, and 2.90¢ and 3.50¢ respectively for small lots, but these prices are shaded to best buyers. Manufacturers' stocks are being reduced rapidly, and for this reason an improvement in prices is expected before very long, as, at present rates, very few of them are realizing cost.

Pig Lead.—The market is quiet, the sales of the week footing up about 300 tons only, for which 3.60¢ was paid. Bids of 3.50¢ have been made, but sellers ask 3.55¢. The consumption is heavy and dealers do not anticipate much lower prices.

H. R. Durkee & Co., 115 Dearborn street, Chicago, have been appointed agents for the sale of the Brier Hill Iron and Coal Company's Pig Iron.

The Pottstown Iron Company, of Pottstown, Pa., have established Western offices at 95 Fifth avenue, Pittsburgh and 115 Dearborn street, Chicago, for the sale of their Universal and Sheared Plates for all purposes. Charles E. Billen is agent.

The Hinkle (Charcoal) Furnace, at Ashland, Wis., made 100 tons of pig iron on the 2d inst. This beats the record made by any other charcoal furnace very considerably.

One of the Sheridan furnaces of Kaufman & Co. has chilled.

Pittsburgh.

Office of The Iron Age, 77 Fourth Ave., Pittsburgh, February 5, 1889.

The weather continues unfavorable, and the roads are in an almost impassable condition. The Monongahela River coal works, after having been idle for two months, started up yesterday, affording work for some 6000 miners. Most of the coal loaded at present will be for Southern markets, as operators are anxious to take advantage of the spring rises to get it out. The Cincinnati, Louisville and St. Louis markets continue well stocked. Cincinnati, it is claimed, has enough to run it for several months. If many of our manufacturers carry their threats into execution, and discard natural gas for fuel, there will be a largely increased consumption of coal here.

The new Rail mill of the Allegheny Bessemer Company, located at Duquesne, a small town on the Monongahela River, a few miles above, were partially started up yesterday for the first time; the mill, while not of the capacity of the Edgar Thomson, is said to be one of the most complete in the country, having been supplied with all the latest appliances and improvements.

Pig Iron.—We have to report a continued dull, unsettled and considerably demoralized market. While the offerings do not appear to be excessive, they are more than the demand. Furnacemen do not see how it is possible for prices to go lower, but they have been feeling this way for some time past, and yet the market has been steadily getting away from them all the while. As compared with prices of a week ago, there has been a further decline of 25¢ @ 50¢ per ton. We now quote as follows:

Neutral Gray Forge.....	\$14.50 @ \$15.00, cash.
All Ore Mill.....	15.75 @ 16.00, "
White and Mottled.....	14.00 @ 14.50, "
No. 1 Foundry.....	16.50 @ 16.75, "
No. 2 Foundry.....	15.75 @ 16.00, "
No. 1 Charcoal Foundry.....	23.50 @ 24.00, "
No. 2 Charcoal Foundry.....	21.00 @ 21.50, "
Cold Blast Charcoal.....	25.00 @ 25.50, "
Bessemer Iron.....	16.25 @ 16.50, "

Included in the sales reported were Forge Irons at \$14.50 @ \$15, and Bessemer at \$16.25, both cash.

Muck Bar.—Continues very dull, and in the absence of sales it is difficult to give reliable quotations; there is no demand, and while it has been offered at \$27, cash, the inference is that it might be bought for less. Buyers who contracted some time ago, when prices were a good deal higher than they are now, are squirming a good deal.

Spiegel.—Continues quiet, with no recent change in prices; sales mostly small—quoted at \$28.50 @ \$29 for 20%; Ferro-manganese, \$56 @ \$56.50, cash, for 80%.

Manufactured Iron.—Demand continues light, and prices are weak and drooping in sympathy with the raw material. It is hoped, however, that orders will be coming forward more freely before the close of the present month. Bars are quoted at 1.70¢ @ 1.75¢; Plates, at 2.15¢ @ 2.20¢; No. 24 Sheet, 2.80¢ @ 2.85¢, all 60 days, 2¢ off for cash. Skelp Iron, 1.75¢ @ 1.80¢ for Grooved, and 1.90¢ @ 2¢ for Sheared.

Wrought-Iron Pipe.—The Pipe trade continues in much the same condition as noted in our last report. There is a fair business for the time of the year, but it is difficult to give reliable quotations, as the market is open and each firm is free to make its own rates. Discounts are quoted, large lines, as follows: On Black Britt-Welded Pipe, 55 and 5 @ 57%; on Galvanized do., 50 and 5 @ 5%; on Black Lap-Welded, 65 @ 67½%; on Galvanized do., 55 and 2½%; Boiler Tubes, 65%; 2-inch Tubing, 11¢ @ 12¢ per foot, net; 5½-inch Casing, 85¢ per foot, net.

Old Rails.—Continue dull and prices are weak and unsettled. Some sales reported at \$23.50 @ \$23.75 for American. The expectations of the more sanguine in regard to the course of the market this winter have not been realized; instead of an advance, as they expected, prices have declined, and here we are in mid-winter, when it was expected prices would be up, and Rails are not worth as much by from \$1.50 @ \$2 per ton as they were during the fall. This may be attributed to the very open winter, and the work of lifting has at no time yet been suspended. Old Steel Rails are quoted at \$18 @ \$18.50 for short and \$20 @ \$20.50 for long lengths.

Steel Rails.—Manufacturers here continue to quote at \$28 cash on cars at works, and while this price is being obtained for small lots, it is well known that no such price could be obtained for anything like a desirable order. As noted elsewhere, the new mill of the Allegheny Bessemer Company is about to be started up, but being new it will require some time to get it fully into operation.

Billets, &c.—The demand continues light, and prices are weak and drooping, and may be quoted at \$28, and Nail Slabs at \$27.50; Domestic Blooms and Rail Ends dull, and in the absence of sales may be quoted at \$18.50 @ \$19.

Railway Track Supplies.—Demand continues light, and prices are weak and drooping. Spikes 2.10¢, 30 days, free on cars at works; Splice Bars, 1.75¢ @ 1.80¢; Track Bolts, 2.80¢ with Square and 2.90¢ with Hexagon Nuts.

Merchant Steel.—There is a very fair business, but prices are no better, and this is about the only source of complaint. Best brands of Tool Steel, 8½¢; Crucible Spring Steel, 4½¢; Crucible Machinery, 5¢; Open Hearth do., 2½¢.

Old Material.—Demand continues light and prices are weak, but without important changes. No. 1 Wrought Scrap, \$20.50 @ \$20.75, net ton; Wrought Turnings, \$13 @ \$13.50; Car Axles, \$24.75 @ \$25; Cast Scrap, \$14.75 @ \$15.25, gross; Cast Borings, \$11.50 @ \$12; Old Car Wheels, \$19.

Louisville.

LOUISVILLE, KY., February 2, 1889.

Pig Iron.—There has been no change in the price of Iron during the past week; a decrease in the number of sales, however, is noticeable, as most consumers have supplied their wants for the following six months. Sales of Close Silver Gray have been made at \$11.75, cash, cars Louisville, which is the lowest price accepted since the present depression. We have no change in prices, and quote for cash in round lots as follows:

Southern Coke, No. 1 Foundry, new classification.....	\$14.75 @ \$15.25
Southern Coke, No. 2 Foundry, new classification.....	14.25 @ 14.75
Southern Coke, No. 3 Foundry, new classification.....	13.75 @ 14.25
Gray Forge.....	13.25 @ 13.75
White and Mottled, different grades.....	12.75 @ 13.25
Silver Gray, different grades.....	13.00 @ 13.50
Southern Charcoal, No. 1 Foundry.....	16.25 @ 16.75
No. 1 Mill.....	14.75 @ 15.25
Southern Car-Wheel, standard brands.....	21.75 @ 22.75
Southern Car-Wheel, other brands.....	18.00 @ 19.50
Hanging Rock Coke, No. 1 Foundry.....	15.50 @ 16.00
Hanging Rock Charcoal, No. 1 Foundry.....	19.50 @ 21.00
Hanging Rock, Cold Blast.....	20.75 @ 23.75

Chattanooga.

Office of *The Iron Age*, Carter and 9th Sts., CHATTANOOGA, February 4, 1889.

Pig Iron.—The tone of the market is somewhat improved, and there is a much better feeling prevalent now than for the past two weeks. The uneven prices at which sales were reported to have been

made have been replaced by steadier prices, and those desirous of buying have made up their minds that if they get much Iron they will have to pay a reasonable price for it, although there is now and then an occasional producer that is inclined to sell under the market. The general opinion seems to prevail that prices have touched the bottom figure, and that prices in the future will take an upward turn. The storage and warrant system seems to meet with special favor, as under its workings a furnace that is indisposed to sell can realize nearly the market value of their product, and, besides, it will no doubt be the means of bringing a good deal of money into the South. As an evidence of a more confident feeling, an offer was made for 1000 tons No. 1 Foundry at \$13, free of commissions, cash in 30 days, which was refused, although the same day 500 tons of Open Bright were sold at \$12.50, cash in 30 days. There is a good deal of Pipe and Stove-Plate Iron moving, and many of the furnaces are well sold up on these grades.

St. Louis.

OFFICE OF *The Iron Age*, 212 N. Sixth st., St. Louis, February 2, 1889.

Pig Iron.—The market is in a dull and apathetic condition, and the few sales reported are generally for small lots. The large purchase made last week by the Shickle, Harrison & Howard Iron Company, which amounted to something over 30,000 tons Southern Coke Iron, and which included Nos. 1 and 2 Soft, and Nos. 2 and 3 Foundry, has about cleaned up the surplus stocks of a number of furnaces which were interested in the transaction, and who say they have no more Iron for sale, at least not at the figures at which it is understood this purchase was made—that is, on the basis of \$13.50 for No. 3 Foundry, which is considered very low. For ordinary sized lots we quote for cash, f.o.b. St. Louis, as follows:

Southern Coke, No. 1 Foundry.....	\$15.25 @ \$15.75
Southern Coke, No. 2 Foundry.....	15.00 @ 15.25
Southern Coke, No. 3 Foundry.....	14.25 @ 14.75
Gray Forge.....	13.50 @ 13.75
Ohio Softeners.....	17.50 @ 20.00
Lake Superior Charcoal.....	21.00 @ 21.50

Missouri.

Charcoal Foundry, No. 1.....	16.00 @ 16.50
Charcoal Foundry, No. 2.....	15.00 @ 15.50

Tennessee.

Charcoal Foundry, No. 1.....	17.50 @ 18.50
Charcoal Foundry, No. 2.....	16.75 @ 17.50

Bar Iron.—Business has been very dull for some time, but indications point to a renewal of activity in the near future. Inquiries are coming in which no doubt will result in business later on. Prices have not been satisfactory, but the outlook is improving and with a spirited demand prices are likely to improve. We quote \$1.90 for lots from store.

Barb Wire.—Shows signs of decided weakness, and business cannot be carried on much longer under the present state of affairs. The "pool," which was formed some time since, and was to go into effect February 1, has collapsed, on the refusal of a few manufacturers to enter the combination, and, as the result, manufacturers are making their own prices, which in some cases are reported very low. The volume of business is in fair proportion to the output, and with an increased demand, which is customary at the opening of the spring trade, manufacturers hope for some improvement in the low prices at present prevailing, which are about as follows: For car lots, 2 and 4 Point Painted, \$2.90; for car lots, 2 and 4 Point Galvanized, \$3.50, f.o.b. St. Louis; less than car lots, 5¢ additional.

Sligo Iron Stove Company, St. Louis, Mo., have been appointed agents for Drill Rods, Hammer, Pick and Wedge Steel,

Spring, Sheet and Machinery Steel and all other kinds of Crescent Steel manufactured by Miller, Metcalf & Parker, Pittsburgh, Pa.

Rogers, Meacham & Shields is the title of a new firm of Pig Iron merchants just established at St. Louis, Mo., with offices in the Laclede Building, the partners being D. B. Meacham, W. H. Shields, Archer Brown and W. A. Rogers. Rogers, Brown & Co. make the following explanatory statement: "We have pleasure in announcing to the Iron trade a change in our St. Louis business, which is in line with the apparent needs at this point—namely, the formation of a distinctively St. Louis Pig Iron firm. It has lately been the subject of remark that the Pig Iron business here is done by branches of Cincinnati and other houses. In organizing the firm of Rogers, Meacham & Shields, our St. Louis business is placed on an independent basis, the new firm working entirely free from the Cincinnati office. Mr. W. H. Shields, who has been our St. Louis representative, is taken into the partnership, and we have associated with us Mr. D. B. Meacham, who, to join us, resigns the position of vice-president and general manager of the Norton Iron Works, manufacturers of Pig Iron and Nails, where he has earned an enviable reputation for large business capacity, conservative management, energy and integrity."

A new firm has been established in St. Louis under the title of A. P. De Camp & Co., Laclede Building, to handle Southern, Ohio, Missouri and Lake Superior pig iron, old car-wheels, old rails, scrap iron and Connellsville coke. A. P. De Camp, one of the partners, has been connected for 11 years with Matthews, Addy & Co., first in their Cincinnati firm, and for the last seven years at their St. Louis branch. William Yule, the other partner, has been for several years in the employ of the L. M. Rumsey Mfg. Company, St. Louis, as stenographer and accountant.

Cleveland.

CLEVELAND, February 4, 1889.

Iron Ore.—The first sale of new Ore for lower lake delivery comprises a 10,000-ton lot of non-Bessemer Menominee Ore, at \$4.15, f.o.b. cars Cleveland. About 2000 tons of this Ore were brought down last season and are now on dock. This will be delivered to the furnace making the purchase, along with the 8000 tons of new Ore to come down after the opening of navigation. This grade of Ore sold at the beginning of last season at about \$3.85, declined at one time to \$3.50, and closed the season at about \$4 or \$4.10. Several local dealers are interested in the sales of new Ore said to have occurred at Chicago late last week and vigorously denied in some quarters. Cleveland dealers are familiar, however, with sales in that city aggregating, perhaps, 30,000 or 35,000 tons. The price was 40¢ in advance of last season's opening quotations and about at the same figure at which the market closed late in November. One year ago over 600,000 tons of old Ore remained unsold on the docks. To-day, outside of a 36,000-ton lot of Soft Ore, unsold on the dock, not 5000 pounds of any one grade of Ore could be scraped together in any kind of an emergency. The odds and ends remaining unsold comprise remnants varying from 400 to 2000 tons in amount. These will be lumped in with new Ore when the active buying movement begins. The agitation over lake freights continues, with a fair prospect of the schedule being finally fixed on a basis of \$1.15 or \$1.20 from Escanaba. The oremen hope for season charters at \$1.10, and the vesselmen ask \$1.35. The concessions will come principally from the latter.

Pig Iron.—Southern Irons are beginning to make their presence felt in the local market, although there is nothing approaching activity in the situation. Scattering sales of Mill Irons at shaded prices are reported. The market, however, possesses a healthy tone, and any amount of confidence is expressed in the future. The new Pig Iron rate has temporarily demoralized business.

Old Rails.—There is no demand, although the price has suddenly tumbled to \$22.50. Only scattering sales at this figure are reported.

(Later, by Telegraph.)

One of the large mining companies reports having made season charters from Ashland to Cleveland at \$1.25 per ton. This rate is far below the price for which vesselmen have been contending, and seems likely to completely demoralize the pool.

Cincinnati.

Office of *The Iron Age*, Fourth and Main Sts., CINCINNATI, February 4, 1889.

Pig Iron.—There has been less pressure to sell Pig Iron in the local market during the past week, and to that extent the market has improved in tone. But there has been no marked recovery in prices, although several large furnaces have withdrawn from the market. The volume of business has been fair, but no very large individual sales have been made. The demand for speculative account has continued, and some purchases for this interest have been made, but there is a disposition among some sellers to discountenance such transactions. The buying has been more of Mill than of Foundry grades, but business has not been confined to either. About 5500 tons Gray Forge, Southern and Northern brands, sold at \$12.75, 3000 tons do. on the same basis, and 2000 tons mixed grades Foundry Iron on basis of \$15 for No. 1. The establishment of the storage or warrant system and its operation already in the South is credited with assisting, if not inducing a more confident feeling, giving moral support to furnaces before its more material benefits have been tested. The following are the approximate prices current here at the close for cash, f.o.b.:

Foundry.

Southern Coke, No. 1 (new classification).....	\$14.75 @ \$15.00
Southern Coke, No. 2 (new classification).....	14.25 @ 14.50
Southern Coke, No. 3 (new classification).....	13.50 @ 14.00
Ohio Soft Stone Coal, No. 1.....	15.00 @ 16.00
Ohio Soft Stone Coal, No. 2.....	14.50 @ 15.00
Mahoning and Shenango Valley.....	16.50 @ 17.00
Hanging Rock Charcoal, No. 1.....	21.00 @ 22.00
Hanging Rock Charcoal, No. 2.....	19.00 @ 22.00
Tennessee and Alabama Charcoal, No. 1.....	18.00 @ 18.50
Tennessee and Alabama Charcoal, No. 2.....	17.00 @ 18.00

Forge.

Strong Neutral Coke.....	13.00 @ 13.50
Mottled Neutral Coke.....	12.00 @ 12.25
Gray Forge.....	12.50 @ 13.00

Car-Wheel and Malleable Irons.

Southern Car-Wheel.....	20.00 @ 25.00
Hanging Rock, Cold Blast.....	22.00 @ 25.00
Lake Superior Car-Wheel and Malleable.....	21.00 @ 22.00

Manufactured Iron.—The demand has been a little improved, and the market has ruled steady.

Nails.—The market has ruled slow and easy in tone, without essential change in prices. 12d. @ 40d. sell at \$1.90 @ \$1.95 per keg, with 10¢ rebate in carload lots at the mills. Steel Nails sell at \$1.90 @ \$1.95, and Steel Wire Nails at \$2.60 @ \$2.65 per keg.

Old Material.—The market has been without improvement. The demand has been light, but there has been no pressure to sell. Old Rails are quotable at \$21.50 @ \$22, and Old Wheels at \$18 @ \$18.50, spot cash.

Detroit.

WILLIAM F. JARVIS & Co., under date of February 4, 1889, report as follows: There has been very little activity in the market here during the past week. A few sales of round lots have been made for future delivery, mostly for Southern Iron. Very few Ohio furnaces are willing to accept present price for long deliveries. Car Wheel Irons are in fair demand, but no very large orders have been booked. Several buyers have made inquiry for round lots of Lake Superior Charcoal for delivery after the opening of navigation, but manufacturers refuse to shade quotations on this grade. With trade quiet, we quote for the present as follows:

Lake Superior Charcoal, all numbers.....	\$19.50 @ \$20.00
Lake Superior Coke, all ore.....	19.00 @ 19.50
Lake Superior Coke, cinder mixed.....	18.00 @ 18.50
Standard Ohio Black Band.....	19.00 @ 19.50
Southern No. 1.....	17.00 @ 17.50
Southern Gray Forge.....	15.00 @ 15.50
Southern Silvery.....	16.50 @ 17.00
Jackson County (Ohio) Silvery.....	18.25 @ 19.75
Old Wheels.....	19.00 @ 20.00

New York.

Office of *The Iron Age*, 66 and 68 Duane street, NEW YORK, February 6, 1889.

American Pig.—The principal event has been the establishment by the Thomas Iron Company of its opening price on Gray Forge, which has been placed at \$15.30, equal to \$15 for Southern ex-ship at tidewater. About 80,000 tons of this grade have been placed by the Thomas Iron Company, nearly all of it with Pipe makers. Additional transactions are pending which are likely to carry the total up to about 50,000 tons. No opening price has been recorded for No. 1 and No. 2 Foundry by the Thomas Iron Company, Mr. B. G. Clarke stating that he has not reached a conclusion, and that there is a possibility that no reduction whatever will be made. It is intimated, however, that low prices are being made in some quarters. Considerable Southern Iron has been placed at private terms, and it is now stated that two of the largest concerns have withdrawn. It is stated by merchants who have close connections with Southern interests that the sharp decline in the West was due to the operations of one large firm there, who succeeded in breaking the market, and purchasing very heavily especially for Pipe makers on the Ohio River. The reports received from the furnaces are not quite complete enough to give the full data. They indicate, however, that as yet there has been no falling off in the make, except on Bessemer Pig. The latter is very weak, both in Pittsburgh and in the East, it having been reported that it has been offered as low as \$15 at the former point, while in the East \$16 is shaded at furnace. Lots are offered for sale by rail mills who had purchased beyond their requirements. We quote No. 1 Standard Foundry Iron, nominally \$17.50 @ \$18; No. 2, \$16.50 @ \$17, and Gray Forge, \$15.30 @ \$15.50, all at tidewater.

Scotch Pig.—We quote: Coltness, \$20.50 @ \$21; Shotts, \$20 @ \$20.50; Langloan, \$20 @ \$20.25; Summerlee, \$20.25 @ \$20.50 and Dalmellington, \$19.25 @ \$19.50.

Plates.—We quote Iron Tank, 2¢ @ 2.2¢; Shell, 2.25¢ @ 2.4¢; Steel Tank and Ship Plate, 2.15¢ @ 2.25¢; Shell, 2.35¢ @ 2.5¢; Flange, 2.6¢ @ 2.75¢, and Fire-box, 3¼¢ @ 4¢.

Structural Iron.—The market is quiet, weak and dull. We quote Sheared Plates, 1.9¢ @ 2¢; Universal Mill Plates, 2¢ @ 2.1¢; Angles, 2¢ @ 2.10¢; Tees, 2.4¢ @ 2.6¢, and Channels and Beams, 2.8¢ on dock for all sizes. The Columbia Iron and Steel Company, of Uniontown, Pa., has joined the Beam Association.

Bar Iron.—We quote: Carload lots on dock, half extras, Common, 1.65¢ @ 1.75¢; Medium, 1.75¢ @ 1.8¢, and Refined, 1.8¢ @ 2¢.

Steel Rails.—No new transactions of any magnitude are reported in the East or South. Some of the sales lately made by Eastern mills were made at a low figure, close to \$28, but it is explained that they were due to special circumstances, the mill having a large accumulation of raw material which it was deemed best to convert into a saleable product. The market is dull and still unsettled, with \$27 @ \$27.50 the nominal quotation.

Tool Steel.—The Crucible Steel manufacturers have reduced the price 1¢ per pound to meet the competition of makers outside the association.

Old Rails.—The market is dull at \$23 @ \$23.50 for Tees here. A lot of 1000 tons afloat for Baltimore is being offered at \$24. We note a sale of 1000 tons at \$23.50, Jersey City.

Metal Market.

Copper.—Aside from small transactions in Lake Copper, which is sold by the small outside companies in modest quantities at 16¼¢ @ 17¢, and in Casting Copper, which fetches 15¼¢ @ 16¢, nothing is doing. The famous extension of contracts with the American mines, which was semi-officially announced as completed over a month ago, is making favorable progress. Negotiations are going on, and rumor has it that they have progressed far enough to be on the eve of being closed. It seems to be the general impression that the syndicate is in a good position to coerce the mining companies, and that it may at the next pool sale decide to mark prices down, with the object of stimulating consumption. As to the stability of the syndicate there seems to be little question—at least, so far as the immediate future is concerned. Chili Bars are cabled to-day \$77.15/ for spot and \$77 for futures, with Best Selected at \$79.10/. The statistical position abroad was as follows on the 1st inst.:

Stocks in Tons.	Jan. 1, 1889.	Feb. 1, 1889.	Feb. 1, 1888.
Chili Bars, Liverpool & Swansea.....	29,120	31,270	32,316
Fine Copper, Liverpool & Swansea.....	20,430	24,400	795
Foreign Copper at London.....	5,630	6,400	2,081
Chili Bars in France.....	29,015	30,300	700
Other stuff in France.....	10,490	10,500	1,500
Afloat from Chili.....	94,685	102,870	37,302
" " Australia.....	5,000	3,600	6,680
" " England to Continent.....	2,300	2,000	1,000
	104,110	108,470	45,482
Receipts and Deliveries.	Dec. 1888.	Jan. 1889.	Jan. 1888.
Chili charters for month.....	2,900	1,900	2,100
Total supplies, England and France.....	11,400	0,700	9,119
Of which from North America.....	2,600	2,800	3,219
Deliveries, England and France.....	5,200	4,300	5,928

Tin.—The market is quiet, and was irregular in London during the greater part of the week, closing steady there at £97 for spot and £97/15 for three months' futures. Here the last sale to-day was 10 tons of February at 21.75¢. **Tin Plates.**—The market has been quiet, but steady. We quote large lines per box: Siemens-Martin Steel, Charcoal Finish, \$4.75 @ \$5.50; Terns \$4.12½ @ \$4.25; Coke Tins, \$4.22½ @ \$4.30, and Wasters \$4.12½ @ \$4.15.

Lead.—The market has been extremely dull and lifeless, the total transactions for the week, large and small, probably not footing up to more than 300 to 400 tons. One sale of 100 tons was made at 3.75¢,

but holders generally are endeavoring to secure 3.77½¢ @ 3.80¢ in a small way. Buyers are utterly indifferent. They will not pay more than 3.75¢, and probably, even at that price, would take only a small quantity. The stock of about 15,000 tons in New York warehouses, and of 5000 tons in Chicago and St. Louis, is under the control of banks and bankers, who advanced 4¢ on the metal. They are not disposed to part with the stock at present prices, so that it does not cut any figure in the market now. Any approach to 3.90¢ or 3.95¢ would probably bring out considerable of it, however. For the present there seems no chance for an advance. On the contrary, the market is decidedly in buyers' favor. We quote 3.75¢ @ 3.77½¢ for Domestic.

Spelter.—We quote 5¢ for Domestic.

Antimony.—We quote Hallett 11.25¢, and Cookson, 13.25¢.

New York Metal Exchange.

The following sales are reported:

THURSDAY, January 31.	
10 tons Tin, March.....	21.80¢
10 tons Tin, prompt shipment.....	21.80¢
FRIDAY, February 1.	
10 tons Tin, May.....	22.15¢
28,000 lb G. M. B. Copper, March.....	16.00¢
28,000 lb G. M. B. Copper, May.....	15.50¢
48 tons Lead, February.....	3.77½¢
SATURDAY, February 2.	
10 tons Tin, April.....	22.15¢
10 tons Tin, May.....	22.15¢
WEDNESDAY, February 6.	
10 tons Tin, February.....	21.75¢

Coal Market.

The dullness of the Anthracite Coal trade at the present time, popularly called the "depth of winter," is phenomenal. The demand falls so much short of the ordinary rate of consumption that severe restriction must be enforced if operators expect to hold up prices anywhere near the schedule. More accumulation is reported at several points and new orders have gone out to shut down collieries. The Reading Company will operate but 21 of their 48 collieries in the Schuylkill, Mahanoy, Shamokin and Lykens Valley districts, and a temporary suspension was ordered by the Lehigh and Wilkesbarre Coal Company. The companies represent that circular prices are adhered to despite the heavy cuts by individuals, but it is intimated that opportunities to sell are improved to the best advantage possible under the circumstances. The regular prices are as follows: Hard White Ash, Lump, \$4.50; Broken, \$4.15; Egg, \$4.40; Stove, \$4.65; Chestnut, \$4.55; Free-Burning, f.o.b., Broken, \$3.95; Egg, \$4.30; Stove and Chestnut, \$4.65; Pea, \$2.75.

Bituminous Coal is in good supply at easy prices. No agreement has yet been reached between the Seaboard Association respecting either production or prices for the Coal year beginning March 1, and the Beech Creek shippers still stand aloof. Cumberland shipments since January 1 are 223,600 tons, a decrease of 25,000 tons compared with last year. The Buffalo, Rochester and Pittsburgh Railroad Company have purchased four large docks on the ship canal in Buffalo, which gives them one of the most extensive water fronts in that city. An immense coal and freight depot is to be erected on the docks. An Altoona dispatch says a Soft Coal syndicate has been organized by Eastern capitalists to develop the rich Coal lands about the towns of Frugality and Hastings, in Cambria County. The syndicate includes Vice-President-elect Levi P. Morton, Gov. James A. Beaver and First Vice-President Frank C. Thompson, of the Pennsylvania Railroad.

The news comes from Hermosillo, Sonora, that negotiations are pending in New York City for the purchase of the Yaqui coal fields of Sonora by New York men.

Fire destroyed the engine house and breaker of the North Ashland, one of the Reading Company's largest collieries, at Ashland.

Henry G. Davis, president of the West Virginia Central Railway Company, gave an elaborate dinner in Baltimore Monday night to the members of the Seaboard Soft Coal Association. President Mayor, of the Baltimore and Ohio Railroad, supplied a special train, and all the New York companies were represented.

Financial.

The business situation is not in all respects satisfactory, dullness being a common complaint, but it is conceded that those influences which restrict trade are in their nature temporary, due in no small degree to extraordinary weather conditions. Money is in liberal supply. The negotiations of railroad representatives at Chicago have been successfully conducted, American securities are regarded with more confidence in foreign markets, and there is some improvement in the export trade, particularly in the movement of grain from Baltimore. Exports of provisions are large, but prices continue on the downward grade. Over 11,000,000 pounds of lard went out last week and fully 8,500,000 pounds of bacon. The wheat markets are unsettled and again lower, with a light demand either for export or milling. The spring season in dry goods at the hands of jobbers has fairly opened, in response to orders from the South. The well-known dry goods house of J. & C. Johnston, Broadway and Twenty-second street, made an assignment without preference. The liabilities are estimated at \$100,000, and the assets consist of stock, &c., and cannot at present be estimated. Coffee is quiet, sugar about steady and most other staples well sustained.

The Stock Exchange markets during the past week showed more activity, and at times were buoyant under cheerful accounts respecting the Western conference, a reduction in the Bank of England rate favoring larger purchases of American securities on foreign account, and reports to the effect that the South Pennsylvania scheme had ceased to be a disturbing influence. Touching this latter point there was a disposition to await further developments. On Thursday, Friday and Saturday there was a gain of several points in the leading specialties. On Monday there was a selling of the grangers on unfavorable reports from the West respecting a decision by Judge Brewer dissolving the injunction against the Iowa Railroad Commissioners, thus giving the State courts more complete control in the matter of railroad freights. A reduction of freight charges averaging 30 % has already been made on the lines of the Burlington system. The choice of Mr. Walker, of the Interstate Board, as chairman of the Executive Committee of the Interstate Railway Association was favorably construed. On Tuesday the most prominent features were a rise in the Chesapeake and Ohio and a further advance in Cleveland, Columbus, Cincinnati and Indianapolis. The market closed generally firm.

Government bonds were firm at the following quotations:

U. S. 4½, 1891, registered.....	107½
U. S. 4½, 1891, coupon.....	108
U. S. 4, 1897, registered.....	127½
U. S. 4, 1897, coupon.....	127¾
U. S. currency 6s.....	120

The total clearings of 42 cities were not up to the average of several weeks past,

but the increase compared with the same week last year was 5.9 %. Outside of New York the increase was 4.4 %. Unlike the previous week, about one-half of the leading centers showed a decline, in no instance material. New York gained 6.6 %, Boston, 2.1 %; Philadelphia, 16.7 %, and Chicago, 6.4 %. For the month of January New York clearings increased 21.8 %; Boston, 17.9 %; Philadelphia, 15.4 %; Chicago, 14.9 %; St. Louis, 10.4 %; Baltimore, 11.8 %; Kansas City, 25.5 %; Milwaukee, 25.9 %; Detroit, 19.2 %, and Minneapolis, 25.9 %.

The weekly statement of the city banks was something of a surprise, the surplus reserve having decreased \$1,121,000, while the loans showed an expansion of \$7,088,000, supposed to be due to activity in the purchase of securities. The surplus reserve now held is \$18,893,000; specie is increased \$855,400, and the deposits other than United States are increased \$6,817,300. Money is in full supply, much in excess of the demand, and the banks discount more freely. Time loans are 2½ % for 30 to 60 and 3 % for 90 days, 3½ % for four and 4 % for five and six months. Rates for commercial paper are 4 % for 60 to 90 days' indorsed bills, 4½ % and 5 % for four months. The disbursements by corporations in this city, February 1, on account of interest and dividends amounted to \$19,500,000.

The market for sterling was quiet and only fairly steady in tone, partly owing to recent foreign purchases of American securities. Posted rates for sterling closed at \$4.87 @ \$4.89. The Bank of England rate was lowered from 3%. Paris advices announce the dissolution of the old Panama Company on the petition of parties representing M. de Lesseps with a view to re-organization.

The public debt reduction during January amounted to \$12,216,284, and the receipts of the Government during the month were \$82,000,000 in excess compared with \$30,700,000 in January, 1888, \$28,300,000 in 1887, and \$24,700,000 in 1886. A noticeable feature in the financial statement is an increase of silver dollars in the Treasury, January 31, to \$14,440,000, from about \$7,600,000 at the opening of the month.

According to the Custom House report, the exports of opium from this port last week amounted to \$398,000, and the imports \$50,000. Since January 1 the exports are \$3,119,000, against \$2,274,000 for the same time last year.

The imports of merchandise at this port last week were heavy, the transactions being \$12,198,000, of which \$3,836,000 represents dry goods. Since January 1 the total is \$50,056,000, as compared with \$46,280,000 last year. The exports were \$6,458,241.

An agreement among express companies to restore express charges to the figures in vogue prior to May 1, 1888, have taken effect, with an average advance considerably over 25 %.

The new Stuyvesant Bank will be situated on the corner of Fifth avenue and 125th street; capital \$150,000.

The Rhodes Holiday bill, providing for full holidays every Saturday during June, July, August and September, encounters strong opposition throughout the State.

Lake Superior Ore Output.—The annual table giving the total output of the iron mines of Lake Superior for 1888, published by the *Mining Journal*, shows that the rail shipments were the largest ever made, and swell the total for the year to 5,023,279 gross tons, the biggest output in the history of the mines. Of this the Marquette range shipped 1,921,525; Gogebic, 1,424,762; Menominee, 1,161,039; Vermilion, 511,953. The largest producers were the Minnesota Iron Companies' mines (Ver-

million district), 457,841; and the Norrie (Gogebic), 412,196. The total output of all the mines since the discovery of ore here is 40,811,861 tons, of which the Marquette range has shipped 2,713,419; Menominee, 8,594,087; Gogebic, 3,586,876; Vermillion, 1,498,209 tons. The Lake Superior mine, at Ishpeming, is credited with the largest product, 4,435,356, and the Cleveland, also at Ishpeming, next with 3,889,150.

British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, February 6, 1889.

Although not as irregular as during the preceding week, prices for spot Copper have varied somewhat widely on a moderate volume of trading apart from one or two large transactions. The syndicate agents are credited with having taken up one block of 200 tons at £77. /5, and they have since kept standing bids of £77. 10/. No advance on £75 has been made for futures, however, and it is a somewhat remarkable fact that there have been very few buyers despite the considerable discount from spot figures. The stock of good merchant brands in the hands of the syndicate increased some 2000 tons last month. The accumulation is cited as evidence of the accuracy of late reports of inability of smelters to dispose of their output to consumers. A considerable portion of the furnace material purchased from the syndicate thus continues to go back into their hands in the form of Bars.

Quite a good business has been done in furnace material latterly, included in which is 500 tons American Matte at 14/6, to arrive in Liverpool. An additional 300 tons at the same price is rumored.

Some little excitement has been caused by a transaction in Cueva Mora Matte, in which the terms of contract between the producers and the syndicate were evidently disregarded. It appears that a cargo was sold direct at 15/. The syndicate agents claimed the lot as theirs under contracts made at 13/, and endeavored to obtain an injunction against the delivery being made to the purchaser. In this they were unsuccessful, hence a momentary excitement and general interest as to the final outcome.

No new facts are obtained from reliable sources with respect to developments in the formation of the proposed English syndicate. There is also an absence of news regarding the success of the alleged negotiations for an extension of contracts with mining companies.

Block Tin experienced a better demand during the early portion of the week, and prices improved under the influence of the favorable monthly statistics and reported small shipments from the Colonies. Some stimulus also came from the result of Thursday's sale at Rotterdam, where 24,000 slabs Banca and 1500 tons Billiton were placed at a parity of £97 15/. in London. Under sales to realize and a contraction of the demand, however, prices subsequently receded about £1. 15/, again stiffening up to-day.

The Tin-Plate market has been quiet, owing mainly to the considerable margin between sellers' and most buyers' ideas on prices. Makers hold out firmly, however,

and have secured their figures on sales involving immediate deliveries. The output is still on a large scale, but on other works that have been standing idle for a long time are soon to be started up.

The negotiations toward forming the proposed combination of Steel Rail manufacturers have thus far been unsuccessful, although the largest firms express willingness to combine on the plans mapped out. Several of their number are, in fact, refusing to enter contracts at the present time, they believing that overtures now made to opposing firms will ultimately result in the formation of the syndicate and a considerable rise in prices. As it is, there seems to be little or no possibility that business can be done except at fully 5/ advance on last week's prices. Steel Blooms are also held at an advance, £4 being now generally quoted.

Scotch warrants have ruled rather weak, until within a few days' time, under free selling on the part of the "bears" and realizations by late buyers who are said to have become disgusted owing to evidence that the bears were not selling "short," but on orders given by makers holding warrants. Apart from this the market has been devoid of special feature and on makers' Iron there is nothing new to report. Middlesboro' Pig is showing increased firmness. Hematites have increased 6d under the influence of the strong market for Steel, and the same cause has led to 2/6 advance on Spiegeleisen.

Scotch Pig.—There has been a fairly active business, with some irregularity in prices, but no radical changes.

No. 1 Coltness, f.o.b. Glasgow	51/
No. 1 Summerlee, " "	50/
No. 1 Gartsherrie, " "	49/8
No. 1 Langloan, " "	49/8
No. 1 Cambro, " "	49/8
No. 1 Shotts, " at Leith	49/
No. 1 Glengarnock, " Ardrossan	47/
No. 1 Dalmeilington, " "	43/8
No. 1 Eglinton, " "	42/8
Steamer freights, Glasgow to New York, 4/	
@ 5/; Liverpool to New York, 10/.	

Cleveland Pig.—Business has increased in volume and the market shows greater firmness. No. 1 Middlesboro', G.M.B., 36/6; No. 3 do., 34/.

Bessemer Pig.—The demand has continued good and the market is stronger at 6d. advance. West Coast brands, mixed numbers, 45/6, f. o. b. shipping point.

Spiegeleisen.—For this material the market is strong at 2/6 advance, with demand brisk. English 20 % quoted 82/6 f. o. b. N. W. England shipping point.

Steel Rails.—Makers generally ask 5/ advance, and are very firm. The demand continues active. Heavy sections quoted at £4. 5/, and light sections £4. 10/ @ £4. 15/, f.o.b. at N. W. England shipping points.

Steel Blooms.—Demand is moderate, but prices are held higher and firmly. We quote £4 for 7 x 7, f.o.b. at N. W. England shipping point.

Steel Billets.—The demand for these continues brisk and prices remain firm. Bessemer, 2½ x 2½ inch, £4. 3/9, f.o.b. at N. W. England shipping point.

Steel Slabs.—Makers hold for higher prices, but the demand is moderate. Bessemer, £4, f.o.b. at N. W. England shipping point.

Old Rails.—Sellers firm on price, but the demand moderate. Tees quoted at

£3. 5/ @ £3. 6/, and Double Heads, £3. 8/ @ £3. 10/, c.i.f., New York.

Scrap Iron.—A quiet market reported, with prices steady. Heavy Wrought quoted at £2. 2/6 @ £2. 5/, f.o.b.

Crop Ends.—There is little doing in these, but holders are firm. Bessemer quoted £2. 10/ @ £2. 12/6, f.o.b.

Tin Plate.—The market rather slow, with prices steady on prompt deliveries. We quote, f.o.b. Liverpool:

IC Charcoal, Allaway grade	15/3 @ 15/6
IC Bessemer Steel, Coke finish	13/6 @ 13/6
IC Siemens	13/6 @ 13/6
IC Coke, B. V. grade	12/ @ 12/6
Charcoal Terne, Dean grade	12/ @ 12/6

Manufactured Iron.—There continues to be a fairly active business, with prices firm for the most part. We quote, f.o.b. Liverpool:

Staff. Ord. Marked Bars	£ s. d. @ 8 2 6
" Common	" 5 15 0
Staff. Bl'k Sheet, singles	7 12 6 @ 12/6
Welsh Bars (f.o.b. Wales)	5 0 0 @ 5 2 6

Tin.—The market fairly active at the lower prices, showing more firmness at the close. Straits quoted to-day at £97, spot, and £97. 10/ @ £97. 15/ for three months' futures.

Copper.—The market still unsettled and irregular. Nominal prices are: Chili Bars £77. 10/ @ £78, spot, and £75 three months' futures. Best Selected, £79.

Lead.—Demand has continued slow and prices show no material change. Quoted at £12. 7/6 for Soft Spanish.

Spelter.—Prices rule very steady, but trade is moderate. Quoted at £17. 17/6 for ordinary Silesian.

Foreign Markets.

EQUIVALENTS.

	Conts.
Franc, Preeta or Lira	19.3
Florin (Netherlands)	40.3
Florin (Austria)	35.9
Milreis (Portugal)	61.08
Milreis (Brasil)	84.6
Mark (Germany)	22.3
	Pounds
Kilogram	2.205
Pical	134.

CHILI.

VALPARAISO, December 7, 1888.—Exports, Copper included, Chilian products have been excessively quiet, to some extent unfavorably influenced by the prospect of a short wheat crop. Copper.—In consequence of the more staple exchange market and the greater steadiness in the Metal in England fluctuations have been but trifling, sales not exceeding 25,566 quintals at \$27.05 @ \$27.30, f.o.b., the latter figure equaling, with 30/ freight per steamer, £76. 10/8. Exchange, 90 days' sight on London, 28½d.—Weber & Co.

WEST INDIES.

PORT OF SPAIN, TRINIDAD, January 4, 1889.—Asphaltum.—Boiled has been steady at \$14.4 and Crude at \$6.84 a ton, f.o.b., inclusive of export duty. There have been exported from this island last year 49,677 tons, compared with 42,157 in 1887 and 35,920 in 1886. Exchange on London, 90 days' sight, \$4.77 @ \$4.83.—E. P. Masson.

EAST INDIES.

MANILA, January 28, 1889.—Hemp—Has been quiet at \$16.05 @ picul, against \$9 same time last year, equaling \$1 ton cost and freight £56. 17/6, against £32. 2/6 in 1888. There cleared for the United States since last cable 12,000 bales, against none last year; since January 1, 36,000, against 13,000; there remain loading for do., 29,000, against 7000. The clearances for England since January 1, have been 12,000 bales, against 34,000; loading for do., 10,000, against 4000; cleared for all other ports, 2000, against 3000; receipts at all ports since last cable, 18,000, against 8000; and since January 1, 47,000 bales, as compared with 34,000 in 1888 and 32,000 in 1887. Freight.—\$7.50 against \$5. Exchange.—6 months sight on London 3/8¼, against 3/8.—Ker & Co., per cable direct, to their agent, Mr. Charles Nordhaus, 89 Water street, New York.

PENANG, December 21, 1888.—Tin—Receipts for the fortnight have amounted to 5000 piculs, of which Europeans took 1900 and Chinese 5000.

The price opened at \$37.40 $\frac{3}{4}$ picul, at which Chinese bought, subsequently gave way to \$36.67 $\frac{1}{2}$, closing at \$36.70, at which the Chinese are again buying.—*Schmidt, Kusterman & Co.*

SPAIN

BILBAO, January 19, 1889.—*Iron Ore.*—A good demand has been noticeable during the week, some cargoes of Rubios bringing 7 $\frac{1}{2}$, the quotations for the same being 7 $\frac{1}{2}$ @ 7 $\frac{1}{2}$, while Campanil has to be quoted 8 $\frac{1}{2}$ @ 8 $\frac{1}{2}$, the latter being rather scarce. There has been a large export movement in Ore during the week, plenty of steamers having arrived to take their turn at the drops. Export so far this year 202,147 tons, against 194,425 same time last year. The total shipments of Iron Ore last year did not exceed 3,631,593, against 4,198,696 in 1887. Of these shipments, 39,956 tons went coastwise, against 28,274 in 1887. *Pig Iron.*—There were shipped last year 1,903,220 kg. abroad, and 1,247,140 coastwise. The export from Spain of Metals of all kinds during the first 11 months of 1888 have been as follows:

	1886.	1887.	1888.
Tons.	Tons.	Tons.	Tons.
Calamine.....	25,009	21,873	24,643
Pyrites.....	621,834	701,841	756,941
Iron Ore.....	3,791,819	4,925,947	4,196,403
Pig Iron.....	46,882	102,798	66,722
Precipitate.....	24,794	25,500	26,453
Quicksilver.....	541	1,122	892
Pig Lead.....	103,149	131,637	118,737

Total.....4,614,028 5,898,718 5,189,796
—*Bilbao Marítimo y Comercial.*

BELGIUM.

BRUSSELS, January 26, 1889.—*Iron.*—The blast furnaces have succeeded in screwing up the price of Forge Pig, and in consequence thereof the rolling mills are about to raise their figures for Finished Iron. The advance in Pig being 2 francs, and 1250 kg. being required to make 1000 kg. of Iron, the probability is that Finished will now be advanced 5 francs by the syndicate. Athus has raised the price to 4.70 francs for his Forge Pig, at which it has been selling currently.—*Moniteur des Intérêts Matériels.*

GERMANY.

HAMBURG, January 26, 1889.—*Iron.*—Pig Iron has been lively and tending upward in Rhenish Westphalia. There has been considerable animation in Spiegel, both for domestic use and export, sales having been made all the way to July 1 at 59 marks $\frac{3}{4}$ ton for 10 to 12 $\frac{1}{2}$. Thomas and Bessemer have remained steady, the syndicate selling Forge Pig at 46 @ 55 marks, and Foundry at 54 @ 61. Luxembourg may be quoted 35 @ 42, English Bessemer, 45 $\frac{1}{2}$ $\frac{3}{4}$ ton. While Finished Iron is lively for domestic consumption, so it is neglected for export. Hoop Iron has been doing tolerably well, and so have Plates, which have been advanced 5 marks $\frac{3}{4}$ ton. The Wire branch is still in a poor plight and selling at an actual loss in consequence of competition. Machine shops and car works continue in good position. Wire Rods are quoted 105 @ 107 at Dortmund, and Steel Rails 120 @ 130. All metals are quiet but firm.—*Borsenhalle.*

SWEDEN.

STOCKHOLM, January 24, 1889.—*Iron Ore.*—The total cost of the Lulca-Ofoten Railroad, which will measure 496 km. in length will be 20,000,000 crowns of 28 $\frac{1}{2}$ American. In the estimate submitted to the Government in connection with the proposed sale of the said railway to the latter, the company fixed the cost at 27,000,000 crowns. In view of this discrepancy and the demand of the company that its Iron Ore should at all times be free from export duty, the hesitation of the Government to buy the line does not cause surprise.—*Dagbladet.*

Imports.

Hardware, Machinery, &c.

Boker, Hermann & Co., Mdse., cs., 12; Arms, cs., 27
Commercial Express Company, Mach'y, cs., 50
Degrauw, Aymar & Co., Chains, 28; do., oks., 4
Delamater, C. H. & Co., Mdse., cse., 1
Downing, R. F. & Co., Mach'y, cs., 2
Eureka Foundry Co., Mdse., pkgs., 3
Field, Alfred & Co., Mdse., cs., 25
Folsom, H. & D., Arms, cs., 8
Hartley & Graham, Mdse., cs., 7
Healy & Earl, Mach'y, cs., 4
Kimback, S. D., Anvils, 205
McDermott, W., Steel Shoes, 120; Steel Dies, 120
Moseman Bros., Hdw., cs., 5
Sumner, Chas. P. & Co., Mach'y, cs., 7
Schoverling, Daly & Gales, Arms, cs., 12; Hardware, cs., 3
Wiebusch & Hilger, Lim., Mdse., pkgs., 17; Anvils, 173; Hdw., cks., 6
Windmuller & Roelker, Gun Barrels, cse., 1

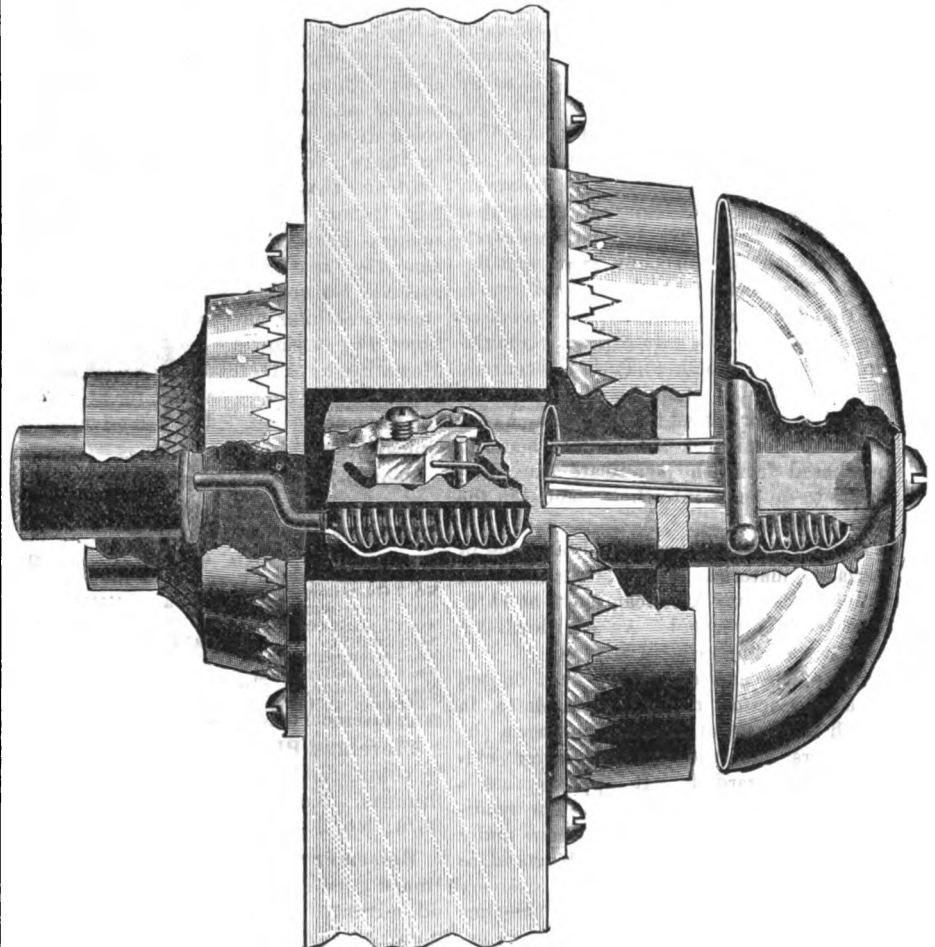
Fauber's Electric Action Door Bell.

A view is herewith given of a door bell which has just been put on the market, and for which a patent has recently been issued. The inventor has combined in this device utility with simplicity, and has succeeded in producing a very satisfactory door bell, which can be sold at a very moderate price. The mechanism is ingenious and simple. The button pushes in like the button of an electric bell, and operates a hammer with a double head, which strikes the bell alternately on either side. One full pressure upon the push-button causes six strokes of the hammer on the bell, and a coil spring of the choicest piano spring wire forces the push-button back into position and furnishes the power for six more strokes, making 12 strokes by simply one pressure. The push button drives before it a stout wire, which

Care of Steam Boilers.

Some instructions relative to the care of the Belleville boiler, issued by the French Navy Department, will be found useful, wholly or in part, by those having charge of other forms of boilers:

1. When a boiler is not in use it should be kept full of water.
2. Whenever a boiler is thrown temporarily out of use, either at sea or when arriving in port, it should be filled with water as soon as the fires are hauled.
3. To be assured that the boiler is completely filled, water should be admitted until it escapes through the safety valve.
4. The boiler should be examined at regular intervals, to ascertain whether any of the water has escaped.
5. If a boiler is to be inspected internally, it should be filled with water when



Fauber's Electric Action Bell.

pushes a steel pin through an irregular slot in the heavy brass plate. The pin is secured firmly to the pivoted end of the hammer, and as it follows the serrations the hammer vibrates and strikes its double head alternately on the bell. The barrel, which is a part of the main or foundation casting, is passed through a $\frac{1}{4}$ -inch auger hole in the door or casing and two screws fasten the frame on the inside. The rosette is then put over the push button and two screws hold it in place. The bell is adjustable to any ordinary thickness of door, say from 1 $\frac{1}{4}$ inch to 3 inches, and, when desired, connections or extra length wires are furnished for casings. If extra length wires were put in every package it would make them too bulky, hence they are only put in when called for. The bells and rosettes are packed singly in pasteboard boxes and labeled, and these are packed in larger telescoped boxes and in wooden cases. H. H. & C. L. Munger, 142 Lake street, Chicago, are sole agents for their sale.

the fires are hauled, and the water should not be discharged until everything is ready for the inspection. This rinsing operation tends to remove corrosive substances from the interior surfaces.

6. When under way, at least 1 pound of powdered carbonate of lime for each pound of cylinder oil used should be put into the well from which the feed pump draws its supply.

7. The use of vegetable and animal oils for cylinders, pump, and all parts in communication with the condenser or hot-well, should be avoided. Mineral oil alone should be used, and the engineer should ascertain, by analysis, whether the oil free from all mixture with animal vegetable fats.

The strike at the car works of the Lima Car Mfg. Company, at Lima, Ohio, which has been in progress for some weeks, has been declared off, and the works are again in operation.

Hardware.

There are on all sides evidences of increased activity, and a fair volume of business is doing. Merchants throughout the country were in many instances later than usual in placing their orders, and as a consequence there is in several lines more or less difficulty in obtaining goods as promptly as desired. Prices are substantially unaltered, there being only a few minor changes. It is to be noted that export trade is especially satisfactory and promising, the indications pointing to a continued increase in its volume.

Cut Nails.

The New York market is reported generally to be in a little better condition, although prices are unchanged at \$1.80 to \$1.90 for carload lots and \$1.90 to \$1.95 for small lots from store.

Wire Nails.

The improvement noted in the tone of the market in Wire Nails continues, and while there has been no quotable advance prices are somewhat firmer, and the extreme prices which were named immediately after the breaking up of the combination have been withdrawn. The manufacturers are in nearly all cases well supplied with orders, and are consequently not making special efforts to book others except at advanced prices. Quotations are \$2.80 for carload lots at factory. Small lots from store are offered at \$2.50 to \$2.60.

Cut Nails.

The regular monthly meeting of the Western Cut Nail Manufacturers' Association was held at the office of the Benwood Iron Works, in Wheeling, W. Va., on Wednesday, the 30th ult. The attendance was only fair, about a dozen firms being represented. The card rate was changed from \$1.90 to \$1.95, subject to the usual discounts.

Miscellaneous Prices.

Under date February 1 the following revised prices of Lead Pipe, Sheet Lead, &c., were announced:

	Per pound.
Lead Pipe.....	6 cents
Block Tin Pipe.....	45 cents
Sheet Lead.....	6½ cents
Tin-Lined Pipe.....	15 cents

Dover Stamping Company, Boston, Mass., have reduced the price of their Dover Egg Beaters, which are now sold at \$1.50 per dozen.

Our readers will observe that Boston and Lockport Block Company, Lockport, N. Y., for whom the Henry B. Newhall Company, 105 Chambers street, New York, are agents, in their advertisement on page 45 illustrate Reed's Hay Fork Pulley, calling attention to its special feature as a self-oiler. It is made in two sizes, Nos. 45 and 60, the former taking regular sized rope and No. 60 being made with an extra opening to pass knots. The self-oiling feature is illustrated, showing the simplicity of the device, and the excellence of the Pulley is alluded to. No. 45 is listed at \$5.50 per dozen and No. 60 at \$7.50 per dozen, subject to a discount of 50 and 7½ per cent. They are packed in barrels of 5 dozen each; weight, 40 pounds to the dozen.

The File market is acknowledged by all the manufacturers to be in an unsatisfactory condition, on account of the extremely low prices which are prevailing, the prices being, in fact, lower than ever before, the market having fallen away somewhat during the last few months. There is, however, a great deal of irregularity, ranging from the comparatively high prices quoted by concerns whose position in the market

enables them to obtain higher prices than their competitors, to the extremely low prices offered by others, and which are regarded by many of their more conservative competitors as below the cost of production. In this condition it will be seen that manufacturers who have an acknowledged position in the market and are able to get good prices are to be congratulated, while those who find it necessary to offer low prices in order to dispose of their goods find the situation especially unsatisfactory. The severe competition thus existing between the cheaper grades makes it difficult for those occupying the middle and higher levels to advance prices, and the effect in slightly weakening prices is to a certain degree felt. With the advances which have occurred in the price of Steel, it is the more surprising that there should have been the continual shrinking in the price of Files. What the outcome may be remains to be seen. Severe competition and low prices have the effect of discouraging some of the manufacturers, and if the present state of things continue it is not unlikely that some will withdraw from the market, thus to a certain extent diminishing the production and possibly preparing the way for a more satisfactory condition. There is, however, no immediate prospect of the accomplishment of this. In case there should be an advance in prices it is probable that some manufacturers who have withdrawn from the market would again enter it, and there seems to be little probability that the production can be limited to the regular requirements of the trade. This condition of things illustrates the desirability of a reputation for excellence of product, as there are some manufacturers who, in spite of the very low prices obtained by many of their competitors, are selling their goods in fair quantities at remunerative prices, and doing, notwithstanding the general demoralization, quite a satisfactory business. A more conservative course on the part of manufacturers who are making unremunerative prices would obviously improve the situation.

In regard to the revised list of Steel Skeins, to which reference was made in our last issue, it should be stated that several of the manufacturers did not attend the meeting and have not adopted the new list, so that at the present time there is no uniformity in lists on these goods.

McIntosh, Huntington & Co., Cleveland, Ohio, are calling attention to a lot of best second-growth shaved single-bit Axe Handles, which they are offering at \$2 per dozen.

L. S. Starrett, Athol, Mass., issues a circular describing his new Divider, No. 86, which is furnished with auxiliary caliper legs, which, together with a common pencil, may be used interchangeably with the arms, forming a variety of useful combinations. In a circular, dated 1st inst., it is stated that the discount on his list is 25 and 10 per cent., except the following tools, the discounts on which are as follows:

Spring-Bowed Calipers and Dividers.....	dis.
Micrometer Caliper Scale, No. 28.....	dis., 25 %

It is also stated that new Micrometer Gauges soon to be put on the market will be sold at discount 25 per cent.

Kingery Mfg. Company, 9 West Pearl street, Cincinnati, Ohio, issue a circular relating to their Economy Ice Cream Freezer, in which a cut is given showing its construction. These circulars are furnished for distribution by dealers to their customers. They name the following net prices on the Freezers:

2-quart.....	per dozen, \$10.56
3-quart.....	" 12.60
4-quart.....	" 13.80

Manufacturers of Augers and Bits have been considering what action can be taken with a view to securing a more satisfactory condition of things in this line, and a meeting will be held to-morrow for this purpose.

The market on Bright Wire Goods is in a somewhat better condition, some of the extreme prices having been withdrawn. The ruling quotations are, however, still very low, and referred to as yielding little, if any, profit.

Prices of Wood Planes have reached a very low point, beyond which it is not thought likely that they will much farther recede. The competition between the manufacturers is well maintained.

The following is the price list of Fauber's Electric Action Bell, of which a description is given on page 212, and for which H. H. & C. L. Munger, Chicago, Ill., are sole agents. It will be noted that Bells and Rosettes are listed separately. The list is subject to a discount of from 25 to 30 per cent.:

	Per dozen.
No. 31—3-in. Pressed Gong, Nickel Plated, without Rosette.....	\$13.00
No. 32—3-in. Bell Metal Gong, Polished, without Rosette.....	16.00
No. 41—4-in. Pressed Gong, Nickel Plated, without Rosette.....	18.00
No. 42—4-in. Bell Metal Gong, Polished, without Rosette.....	21.00
(Bells packed singly).	
No. A—Rosette—Imitation Bronze.....	2.00
No. B—Rosette—Genuine Bronze, No. 1 finish.....	3.75
No. C—Rosette—Genuine Bronze, No. 3 finish.....	3.75

Saddlery Hardware in Philadelphia.

A harness-makers' association has recently been formed in Philadelphia, the object of which, as stated by them, is to compel the wholesale Saddlery Hardware houses to cease retailing goods or selling to consumers, and their demand to this effect having been made upon such houses has been by some of the leading concerns refused. It appears that it has been the custom in that city for the wholesale houses to retail to a certain extent in connection with their jobbing business, the principal articles so sold being Horse Covers and Lap Robes, a line of goods not usually carried by the harness-makers, though other goods were also retailed. This condition of things was naturally more or less antagonistic to the interests of the latter class, and the association formed to prevent this practice refused to purchase goods from any of the houses who will not bind themselves not to sell under any circumstances to consumers, a demand which, as intimated above, has been refused by such houses as Jesse Lee & Sons, Conrad B. Day & Co., Yerkes, Jones & Co., and Geo. B. De Keim & Co.

It is quite probable that there is some grievance in connection with the practice in question which should be rectified, but the system of boycott which has been determined upon by the associated harness-makers is not only objectionable on account of its interference with trade usages, but is not likely to accomplish the desired result, and if the measures already adopted are adhered to, it is probable that some of the wholesale houses will be disposed to open retail establishments of their own, and thus become formidable competitors with members of the association. But, as reflecting more accurately the situation, we give below extracts from several letters relating to the matter, as the principles involved in the controversy are of general interest, from their relation to trade methods and their bearing upon the question as to the control of business, which it is feasible to secure by organization among interested parties. Writing on this subject, a promi-

nent house, after referring to the circumstances under which the demand is made, state their position as follows:

We have always sold our goods to any one who will pay our prices for them, and shall continue to do so as long as we can find customers. We have heretofore protected the harness-makers, to whom we made a liberal discount from retail prices. If we are to be boycotted because we will not consent to the Harness Makers' Association regulating so much of our business as to dictate to us whom we shall sell to, while they buy from whom and where they please, including the manufacturer who supplies the jobber, we may be led to adopt a different course.

For a long time past the manufacturers of Saddlery Hardware and all horse materials have solicited the trade of the harness-makers of this city, who in return patronize them even at the same, and sometimes higher, prices than the jobbers would sell the same articles for. While they want to obligate the wholesale houses not to retail or sell to consumers, they claim the privilege of buying from whom and where they please and where they prefer. We have no idea that the arrangement will be lived up to for any length of time by the jobbers who have agreed to the terms of the association. From time immemorial Saddlery and Harness Goods have been retailed by the jobbers, and it will be almost impossible to avoid retailing, as three-fourths of the harness-makers buy their goods in that way.

A more full statement of the situation is given in the following letter, in which, it will be observed, an intimation is given that in case the effort is continued by the harness-makers, some of the wholesale houses will resort to aggressive measures for their defense:

Some weeks ago several retail harness-makers of this city, claiming to represent an organization called the 'Harness Makers' Protective Union, called upon us and handed us a paper for our signature, whereby we were to agree (1) not to sell to consumers, and (2) not to sell to any dealers but harness-makers. The utter absurdity of the second proposition was so apparent that it was afterward withdrawn, and we were requested to accede to the first proposition only. Had it been a mere matter of obliging we could readily have done this, for our sales to consumers amount to but little, as we in no way seek retail trade and are not equipped to look after it; but during the 35 years we have been established in this same location our house has become known and more or less persons persist in coming here for goods—particularly fine imported Saddlery and specialties—which they know we keep. We saw, however, that there was a principle at stake and that if we at all recognized the right of outsiders to make rules for the management of our business we were only at the beginning of trouble, and that we might involve ourselves in a contract which it would be impossible to keep and which we could not honorably break. We accordingly declined to sign the agreement or to deal with the association or any of its committees. We hold that differences between a house and its customers should be settled solely by the parties concerned, and that the interference of others, who are either competitors or who never deal with the house in question, is purely a piece of impertinence. We also decline to be used as a club to beat the heads of the real offenders, whoever they may be.

It has been asserted, and we believe with perfect truth, that the retail dealers have been injured by some wholesale houses selling to consumers at the same prices as to the trade. This is a wrong which calls for a remedy, but it must be settled between the parties concerned and not by formation of organized conspiracies to boycott houses which have nothing to do with the actual grievance and decline to be made parties to it. We find already that some of the more reasonable men in the union are perceiving that the action taken is inequitable and unbusinesslike and are putting the blame on the more ignorant members of the organization, who each had a vote and were ready to carry any resolution to bulldoze the wholesale houses.

In the West the movement had some success, as the practice of combining retail departments with wholesale houses does not seem to have become established, but here in the East, where so many large wholesale houses have retail departments which in no way interfere with their jobbing trade, it has become so well established that it is impossible to root it out, and the possible effect of this boycotting may be to make some of the jobbers open up regular retail departments for local trade, thus making themselves dangerous competitors to the boycotters.

Another well-known house writes as follows:

A committee of five members called upon us and presented a petition requesting us not to sell goods to any one except the harness-makers. Our trade being limited to a few of them, of course we could not consider their demands, but wrote we would give them our whole business for its equivalent. To this they made no reply. You can readily understand that we cannot, in justice to ourselves, allow any outsiders to run our business as long as we have our bills and expense account to pay.

Items.

In addition to the statement made in our issue January 17 by the Putnam Nail Company, Neponset, Boston, Mass., in regard to their prices and the method of marketing their goods, they further advise us in regard to deliveries, stating that the Western boundary of their delivery is Omaha. They will, therefore, allow Omaha freight or its equivalent on direct shipments in not less than 10-box lots from either storehouse, Boston or Chicago.

Sheldon Axle Company, Wilkesbarre, Pa., under date January 31, contradict emphatically a report which has obtained currency in some of the papers to the effect that they have temporarily suspended. They characterize it as entirely without foundation in fact, and so far from suspending temporarily state that they have been running continuously since the first day of September without shutting down their works except for accidents that are liable to occur in any manufactory. As the dispatch in question might be so construed as to refer to financial distress, they state that the company are entirely solvent and prosperous, with an excellent prospect for their future success.

Silver & Deming Mfg. Company, Salem, Ohio, have issued an illustrated catalogue and price list, which is exceptionally complete, attractively printed and well arranged. It is a volume of 224 large pages, fully illustrated, and containing a good deal of matter of interest to and for the convenience of their patrons, such as telegraphic cipher code, rules and tables relating to hydraulics, with other information concerning Pumps. The extent of their line of Pumps is indicated by the following classification: Cistern, House Force, Shallow Well, Wind Mill, Power Force, Double-Acting Force, Rotary Force and Miscellaneous, and also Well Pump Standards, Cylinders or Working Barrels, Pump Fixtures, Hydraulic Rams, &c. The catalogue also includes a line of Fittings, Pipe-Fitters' Tools, Well Tools and Supplies, &c., with Drills, Wagon-Makers' Tools, Sausage and Meat Choppers, &c. The catalogue is a very creditable one and represents their important line in a way that will be appreciated by the trade.

The National Tube Works Company's Chicago branch, Charles A. Lamb, local manager, has issued a very artistic calendar designed and engraved by John A. Lowell & Co., of Boston. The subject of the illustration, which occupies the major part of the calendar, is "Pussy's Dream," a cat being represented asleep, surrounded by shadowy forms of mice engaged in various antics.

The Ridgway Refrigerator Mfg. Company, of Philadelphia, Pa., have issued their 1889 catalogue representing their line of Refrigerators, with illustrations of the different patterns and a full explanation of their patent system. The air in their Refrigerators circulates over metallic troughs which are located in the cold-air flue, and as these troughs are exposed it is described as coming in contact with the flowing water in them, which absorbs impurities and carries them out of the Refrigerator. The fact that the Refrigerators are guaranteed absolutely dry is a point on which special emphasis is laid. The trade of the com-

pany was until the last few years comparatively limited in the extent of country covered by it, but they advise us that they are now sending Refrigerators to all parts of the country and many to Europe, and are now negotiating for a further increase in trade with other foreign points. For the coming season they have largely increased their facilities for manufacturing the goods.

Horton, Gilmore, McWilliams & Co., 172, 174 and 176 Lake street, Chicago, have taken up Bicycles, Tricycles and Safety Machines as a special department of their business. They claim to have as large a stock of these goods as any house in the country who make them their exclusive business, including every variety of wheeled vehicle in this line. They will put on the market this season a new full ball bearing 30-inch Safety Machine, known as the "J. M. Horton," which they claim to be the best ball-bearing machine made, having a number of features not found in other makes. This pattern will be controlled by them exclusively, as they have contracted to take the entire product of the factory at which they are made. The firm are putting themselves in line with the movement now making rapid headway in favor of Safety Machines. They will have a half ball-bearing machine called the "J. M. Horton, Jr.," and will also have a complete line of ladies' and misses' Safety Machines, besides two new Safety Machines for boys. Their catalogue of Bicycles, which will soon be out, will embrace, in addition to the above, a full line of the new lever gear Tricycle and a one-chain misses' Tricycle, with center gear, making in all 15 new machines for the season of 1889. They have greatly improved their high grade full ball-bearing Bicycle, introducing many new features in its construction, and their boys' and youths' Bicycles have been brought up almost to the standard of the machines used commonly by men.

Jacob Born, of the firm of Rice, Born & Co., New Orleans, one of the most prominent Hardware merchants in the South, died last week. He was widely known and esteemed, and, by his ability and energy, was instrumental in building up a large and successful business.

The S. A. Haines Company, 90 Chambers street, New York, have been organized, carrying on the business of S. A. Haines, and thus representing directly a number of manufacturers of leading lines and specialties with which the trade are familiar. They include the following houses, among which it will be observed that the National Wire Mat Company are a recent addition, the agency having been lately assumed by the company:

BELLEFONTE IRON AND NAIL CO.
L. M. DAYTON.
TOWNSEND, WILSON & HUBBARD BOLT CO.
JAMES MCKAY & CO.
LOGAN & STROBRIDGE IRON CO.
I. S. SPENCER'S SONS.
DILLE & MCGUIRE MFG. CO.
NATIONAL WIRE MAT CO.
NORFOLK SHEAR CO.
E. JENCKES MFG. CO.
STARR BROS. BELL CO.
H. CHAPIN'S SONS.
NATIONAL RIVET WORKS.
CHARLES F. HENIS CO.
THE LUFKIN RULE CO.
STEEL PULLEY AND MACHINE WORKS.
NEW JERSEY BRUSH CO.

Mr. Haines is to be congratulated on this new departure, and the company will have the best wishes of the trade for their success. In a few days Mr. Haines will start upon a trip, during which he will visit many of his friends among the leading houses of the West and Southwest, soliciting their orders for the goods of the above-named manufacturers.

The firm of W. H. Hilligas & Co. Hardware merchants at Naperville, Ill.

was dissolved last week. W. H. Hilligas has bought out his partner, Louis Reiche, and continues the business.

The F. P. Scott Hardware Company, of Denver, Col., are reported to have been burned out on the 2d inst., with a loss of \$80,000, insured for \$40,000.

Western Block Company, Lockport, N. Y., a new concern which has recently commenced the manufacture of Wood and Wrought Iron Tackle Blocks, have issued an illustrated catalogue and price list showing the variety of goods of the Anvil brand, which they are putting on the market.

An extremely pleasant incident occurred on Saturday afternoon, February 2, at the works of the Auburn Mfg. Company, the well known and extensive manufacturers of Agricultural Hand Implements, at Auburn, N. Y., and one which it is a pleasure to record on account of the long and faithful services of an efficient officer and as an instance of the harmonious and kindly feelings which should exist between such and the employees under their charge. C. E. Stevens, the treasurer and manager having been connected with that institution for a period of 20 years, it was deemed a suitable occasion to manifest the regard and esteem in which he is held by the employees, and he was accordingly surprised at the close of the day's work by the presentation, in a neat speech by one of their number, of a very large and elegant Turkish rocker in mahogany, and upholstered in the finest quality of frise plush of same color, and manufactured to order especially for the event. The recipient was completely surprised, and though visibly affected thanked the donors heartily in a few brief remarks, at the close of which "Havanas" were dispensed and indulged in while the company dispersed.

Dover Stamping Company, 88 North street, Boston, and Cambridge, Mass., have elected the following officers: Edward H. Whitney, president; Joseph Moulton, clerk; Horace N. Loveland, treasurer. The board of directors is composed of the above and Thomas Ferrald and A. O. Swain.

The trade will observe among the special notices one signed "M. H." The advertiser, we are informed, represents an old-established and reliable firm, who are desirous of securing agencies for Philadelphia of goods working in with their own, particularly that of a manufacturer of Electrical Supplies.

The Enterprise Mfg. Company, Philadelphia, Pa., issue circulars relating to the Enterprise Lawn Mowers for 1889, their Cork Puller and their Family Outfit of Sad Irons, which are furnished in cases containing a set of Mrs. Potts's Cold Handle Sad Irons, a Polishing Iron and a girl's Iron, either nickel-plated or plain polished.

The Medford Fancy Goods Company have removed to their new location, 44 and 46 Duane street, New York, where, with their five-story building, they are given greatly improved facilities, which will enable them to give prompt attention to orders. They have issued a circular of unique and effective design, in which this change of location is announced, and also call attention to it in their advertisement on page 79.

The Fieldhouse & Dutcher Mfg. Company, of Chicago, who were slightly embarrassed last fall, have satisfactorily arranged with their creditors by passing their business into the hands of a board of trustees, composed of the following well-known manufacturers: E. H. Cole, of Eaton, Cole & Burnham Company, New York; J. R. S. Boardman, of Ronalds & Co., New York; Joseph C. Platt, of the

Eddy Valve Company; A. L. Murphy, of the Conshohocken Tube Company, and O. R. Hodge, of the Dubuque Brass and Metal Company. The trustees will continue the business for three years for the benefit of all concerned. W. F. Kyle, of New York, has been engaged by the trustees as general manager, and took charge of the business on the 17th of January. Mr. Kyle is thoroughly conversant with every detail of the business, having been secretary and manager of the McNab & Harlan Mfg. Company, 56 John street, New York, whose works are at Paterson, N. J., for 25 years, withdrawing from active duties in connection with that company in June last. He has had intimate business relations with the Fieldhouse & Dutcher Mfg. Company for many years, and is a personal friend of the senior member. He makes some sacrifice in transferring himself to Chicago from his home in Brooklyn, and deserves success in his efforts to improve the condition of his trade associates. The Fieldhouse & Dutcher Mfg. Company have been carrying a very heavy stock of Pipe for Gas and Steam Fitting, Brass Goods and Plumbers' and Steam Fitters' Supplies, which are in limited demand, because of the exceedingly mild weather which has prevailed throughout the West this winter.

L. L. Chadwick's 1889 catalogue of Monroe Bros.' Patent Indurated Fibre and Stoneware Lined Refrigerators, Cleveland, Ohio, for whom Cordley & Hayes, 37 Barclay street, New York, are agents, has been issued. The advantages of these Refrigerators are mentioned, and attention called especially to some new designs for the coming season. Some of these goods are lined throughout with indurated fibre, the advantages of which for this purpose are referred to, while others are lined with stoneware. Besides illustrations showing the different patterns put on the market, a number of testimonials are given in regard to the merit of the article.

Simmons Hardware Company, St. Louis, Mo., issue a circular describing the Everlasting Patent Lock Wedges, of which they are exclusive manufacturers under C. J. Grellner's patent. The circular, which has four pages, is devoted to a description of these Wedges, showing their construction in detail and the principle on which they work, illustrations also being given of the different patterns which they make, including Axe, Hatchet, Short Hammer, Long Hammer and Sledge Wedges, all of which are made in different sizes, the dimensions of which are given. This Wedge, as many of our readers are aware, is made of malleable iron, and has on one side a half-round groove or channel terminating into an opening through the wedge. The lock piece made of half-round wire and beveled at one end is driven into the groove after the wedge has been inserted in the handle in the usual way, and is then driven home. The construction is such that the lock piece is compelled to turn through the wedge, and projects into the wood on the other side, thus fastening it very securely.

E. C. Meacham Arms Company, St. Louis, Mo., have issued their No. 390 price current, which bears date January 26. It relates to their usual varied line of Arms, Ammunition, &c., and has prefixed their discount sheet, giving key to quotations.

As will be seen by the announcement on page 80, Henry G. Cordley and James E. Hayes, under the firm name Cordley & Hayes, have associated themselves together in a general commission business. Mr. Cordley was the late general manager of the Union Indurated Fibre Company, and Cordley & Hayes succeed to their business at 37 Barclay street, New York, and 46 Federal street, Boston. They will repre-

sent the United Indurated Fibre Company, Portland, Me., and Lockport, N. Y.; Watertown Indurated Fibre Company, Watertown, Mass.; Oswego Indurated Fibre Company, Oswego, N. Y.; Fiberite Mfg. Company, Skowhegan, Me., and L. L. Chadwick, Indurated Fibre-Lined Refrigerators, Cleveland, Ohio.

The Diamond Wrench and Tool Company, Portland, Me., have issued an elegantly printed catalogue for 1889, in which they show their line of Diamond Wrenches, illustrating the different patterns, their Screw-Drivers and Hammers, Hatchets, Braces and other goods, many of which embody special features. In their circular to the trade they allude to the fact that they have a model factory, fully equipped with modern machinery, and are constantly increasing their line.

The trade will observe the advertisement occupying page 92 of the Lawrence Curry Comb Company, 204 East Forty-third street, for whom John H. Graham & Co., 113 Chambers street, New York, are agents. The company report an excellent demand for their Perfect and Steel Perfect Curry Combs, and refer to them as meeting with marked favor by the trade.

Reference is made in another column to the terrible conflagration which visited Buffalo, N. Y., early last Saturday morning, which wiped out of existence some of the best business blocks in that city. At one time it was supposed that the building of Sidney Shepard & Co. would inevitably be destroyed, and dispatches were sent out during the progress of the fire to that effect, so that in the newspaper accounts it was quite generally stated that this house had been burned out. We are glad to be able to state that such is not the case, as there was a vacant space between them and the fire, which, with the lulling of the wind, saved their property, their building bounding the burned district on the east. Their stock and building are practically uninjured, and their business continues as heretofore without any interruption whatever.

Silver & Deming Mfg. Company, Salem, Ohio, have established an office and sales-room at 72 John street, New York, which is in charge of Richard F. Day, who has a wide acquaintance, especially with the export trade, to which the company are paying particular attention.

Lockwood, Taylor & Co., Cleveland, Ohio, have organized themselves into a joint stock company under the name of Lockwood-Taylor Hardware Company to continue the business formerly done by them as a partnership. John C. Henry and W. C. Talmadge, who have been with the house for many years, become stockholders. The officers of the company are as follows: C. B. Lockwood, president; J. Q. Riddle, vice-president; B. L. Bennington, secretary, and M. Taylor, treasurer. The company allude to their capital and facilities as much increased, and solicit a continuance of the patronage of their customers.

P. J. Conroy & Co., Clearview, Philadelphia, Pa., have issued their 1889 catalogue and price list of Refrigerator and Closet Door Fasteners, Hinges and other Refrigerator and Building Hardware. The Conroy Fasteners, Cast Brass Hinges and Hasps, Cast Bronze Drawer Pulls, Bar and Rail Brackets are shown, and Cold Chisels, Detachable Meat Hooks and other goods are represented, with list prices. They state that they have built a large factory and greatly increased their facilities for manufacturing.

A. M. Ross & Co., Ilion, N. Y., issue a circular describing their Shovels, Scoops, Spades, &c., among which the Remington

Shovel occupies a prominent place. They also allude in another circular to their assortment of Wood and Iron Beam Plows, both steel and carbon, Planters' Hoes, Force Pumps, Hay Tedders, Mowers and Rake Extras.

January 1, 1889, Owens & Barkley, Maysville, Ky., dissolved their business partnership, H. C. Barkley retiring, and the firm becoming Frank Owens Hardware Company, with a capital stock of \$25,000 paid in. In announcing his withdrawal from the firm, Mr. Barkley refers in appropriate and courteous terms to the dissolution, and commending his former partner, Mr. Owens, and the Frank Owens Hardware Company to the patronage and support of the customers of the house, and it is pleasant to note that a partnership which continued without change for 25 years is terminated with the best of feeling on both sides. The new concern, which carries on the business with the familiar trademark, "O. & B.," will have the best wishes of the trade.

Exports from Hamburg to the United States of Hardware, Metal and Metal Goods during the quarter ended December 31, ult., were valued at \$11,324, as compared with \$17,607 for the same quarter of the previous year, showing a material decline. Exports of general merchandise, exclusive of the items named, from Hamburg to the United States increased from \$1,494,000 to \$1,629,000.

In his advertisement on page 60 J. W. McDonald, Cheboygan, Mich., illustrates his patent improved Saw Tool. This implement is intended for use in feeding cross-cut and one-man Saws, and is referred to as a perfect Jointer, Saw-Set, Tooth Gauge, Set Gauge and Swaging Hammer combined in one.

The St. Louis Steel Range Company, St. Louis, Mo., issue a circular giving a number of testimonials in regard to the Joy Range of their manufacture.

The New England Specialty Company, North Easton, Mass., issue an illustrated catalogue of their Hardware specialties and patented novelties. It relates to a line of Screw-Drivers, Can Openers, Kitchen Knives, Mincing Knives, Tack and Family Hammers and similar goods, and also to Shuttle Spring Blanks, Bobbin Catches, Spinning and Speeding Levers, &c.

The National Tubular Axle Department of the National Tube Works Company, 64-70 Federal street, Boston, Mass., issue in attractive form copies of some recent letters relating to the Axle, in which their customers refer to its excellence and its adaptation to a large variety of uses.

Lufkin Rule Company, Cleveland, Ohio, issue a series of blotters representing some of their leading rulers, and also their Steel Tapes recently put on the market. They also send out on a card samples of rolled forged Boot Calks, the toughness and wearing qualities of which are referred to. They are manufactured by a new patent process, which turns them out of uniform size.

Exports.

PER SHIP REPORTER, JANUARY 25, 1889,
FOR MELBOURNE, AUSTRALIA.

By A. Field & Co.—280 dozen Whip Handles, 68 dozen Hardware.
By Wheeler & Wilson Mfg. Co.—628 cases Sewing Machines.
By Rand Drill Co.—3 boxes Wire Fuses, 2 boxes Batteries, 1 box Wire.
By Singer Mfg. Co.—1007 cases Sewing Machines, 231 cases Sewing Machine Oil.
By White Sewing Machine Co.—4576 pounds Sewing Machines, 655 pounds Wagons.
By Lalance & Grosjean Mfg. Co.—2447 pounds H. H. Utensils.
By H. W. Johns Mfg. Co.—1 crate Asbestos Packing.
By Healy & Earl.—34 cases Babitt Metal, 3 cases Belt Fasteners.

By R. W. Cameron & Co.—33 cases Handles, 30 cases Handles, 1 case Knives, 17 Stoves.

By McLean Bros. & Rigg.—4 dozen Drills, 12 crates Stoves, 1 barrel Stove Parts, 6 crates Seeders, 1/4 dozen Seeders, 10 Lamps, 9 dozen Hog Ringers, 20 Boring Machines, 89 dozen Axes, 33 dozen Brackets, 24 dozen Hammers, 36 dozen Lamp Shades, 10 dozen Braces, 91 dozen Axes, 4 dozen Speed Indicators, 48 dozen Wrenches, 2500 Handles, 36 dozen Hammers, 1 case Sewing Machine Parts, 1/2 dozen Wrenches, 49 1/2 dozen Saws, 25 Chucks, 6 dozen Pulleys, &c., 104 dozen Chimneys, 10 Scales, 66 Wringers, 18 dozen Illuminators, 27 dozen Stencils, 2400 Staves.

By R. W. Forbes & Son.—6 dozen Wringers, 4115 pounds Bolts, 5 boxes Bird Cages and Fixtures, 50 dozen Handles, 9 packages Lawn Mowers, 4 1/2 dozen Meat Choppers, 9 packages H. H. Utensils, 120 dozen Axe Handles, 53 dozen Fishing Rods, 6 dozen Wringers, 1203 boxes Clothes Pins, 2 cases Plated Ware, 11 boxes Clocks, 1 case Carpet Sweepers, 2 cases Kitchen Ware, 56 pounds Oil Stone, 9 dozen Axes and Hatchets, 6 1/2 dozen Braces, 23 Lawn Mowers, 5 dozen Thermometers, 4 packages Hardware, 3 dozen Lemon Squeezers, 1 case Stencils, 6 dozen Hammers, 1 case Stencils, 3600 Cartridges, 2 cases Velocipedes, 7 packages Hardware, 2 cases Paint, 3 cases Drilling Machines, 7 packages Wind Mills, 180 boxes Axes.

By Arkell & Douglas.—8 sets Wheels, 47 sets Hubs, 3125 Spokes, 1-6 dozen Presses, 8 dozen Braces, 131 pounds Drills, 4 dozen Rakes, 2 dozen Saws, 8 gross Knobs, 3 dozen Strops, 5 cases Tinware, 1 gross Traps, 6 cases Meat Choppers, 2 dozen Bench Screws, 1/2 dozen Mangles, 1/2 dozen Saws, 1 gross Shade Rollers, 72 cases Shade Rollers, 69 cases Slaters, 6 dozen Razors, 9 dozen Axes, 2 1/2 dozen Braces, 3 dozen Wash Benches, 7 dozen Strops, 12 dozen Hoes, 10 dozen Axes, 41 dozen Saws, 114 dozen Handles, 6 cases Hardware, 24 dozen Handles, 12 dozen Hammers, 36 dozen Handles, 3 dozen Forks, 36 dozen Door Springs, 7 cases Tinware, 12 gross Lead Pencils, 1 gross Latches and Door Springs, 36 dozen Hardware, 77 boxes Handles, 300 dozen Handles, 36 dozen Axes, 6 dozen Hammers, 2 dozen Wringers, 18 dozen Forks, 300 pounds Nails, 2 dozen Sinks, 51 1/2 dozen Saws, 1/2 dozen Lawn Mowers, 12 dozen Handles, 1/2 dozen Drills, 1 gross Castings, 1/2 dozen Castings, 1 dozen Hoes, 84 sets Axes, 6 dozen Bush Hooks, 1 dozen Choppers, 6 dozen Sifters, 324 pieces Tinware, 12 dozen Latches, 728 pounds Bolts, 1/2 dozen Meat Cutters, 1-6 dozen Racks, 8 cases Hardware, 24 1/2 dozen Tinware, 24 dozen Hardware, 1/2 dozen Jacks, 3 dozen Glue, 2 cases Drills, 172 pounds Tacks, 60 kegs Nails.

By Ansonia Clock Company.—14 boxes Clocks, 4 boxes Clocks, 24 boxes Clocks, 31 boxes Clocks.

By M. R. Gildersleeve & Co.—26 cases H. H. Ware.

By Plumbs, Burdick & Barnard.—43,000 Bolts, 40,100 Bolts, 75,500 Bolts.

By Meriden Britannia Company.—2 boxes Plated-ware.

By Rogers, Smith & Co.—5 boxes Plated-ware, 10 cases Plated-ware.

By Nevins & Haviland.—25 gross Shade Rollers.

By Russell & Erwin Mfg. Company.—16 cases Hardware, 1 barrel Hardware, 7 cases Hardware, 42 Cases Hardware, 2 packages Hardware.

By Foreign Trade Agency.—12 cases Clocks.

By Woodhouse & Stortz.—16 dozen Axes, 246 pounds Hardware.

By A. Field & Sons.—200 pounds Iron Nails.

By E. F. C. Young.—407 pounds Lead Pencils.

By F. B. Wheeler & Co.—60 sets Harness, 200 cases School Slates.

By J. A. Babcock & Co.—8 cases Plated-ware, 15 cases Plated-ware.

By W. K. Freeman & Co.—18 cases Hardware, 9 crates Hardware.

By E. T. Hopkins.—10,540 pounds Steel Springs and Carriage Parts.

By J. W. Horton & Son.—780 dozen Handles.

By E. Miller & Co.—91 packages Lamp Goods, 73 packages Lamp Goods, 13 packages Lamp Goods, 3 packages Lamp Goods, 7 barrels Lamp Goods.

By Welsh & Lea.—16 cases Handles, 143 cases Axes, 6 packages Axes, 5 cases Nails, 6 cases Paper Shells, 1 case Skates, 1 barrel Bells, 1 case Shears, 1 case Rat Traps, 3 cases Handles, 1 case Hammers.

By H. W. Peabody & Co.—16,000 pounds Nails, 3 cases Hardware, 1 case Carbons.

By Morris, Strouse & Co.—1 1/2 dozen Clothes Wringers, 1 dozen Money Drawers, 6 gross Shade Rollers, 150 pairs Roller Skates, 84 dozen Gate Latches, 24 gross Hat and Coat Hooks, 4 gross Sad Irons, 5 dozen Grindstone Fixtures, 106 dozen Tools, 3 gross Whisk Brooms, 46 dozen Mouse Traps, 8 1/2 gross

Kitchen Tools, 1 gross Chisel Handles, 128 pounds Washita Stones.

By Strong & Trowbridge.—2 cases Handles, 4 dozen Brooms, 6 bundles Washboards, 12 boxes Clothes Pins, 20 cases Handles, 42 cases Axes, 6 cases Hatchets, 6 cases Axes, 32 cases Handles, 4 cases Bolts, 3 packages Tools, 5 packages Tools, 2 cases Whetstones, 2 cases Hammers, 9 cases Screws, 21 cases Axes, 3 barrels Lampware, 2 cases Pumps, 1 case Tools.

By Coombs, Crosby & Eddy.—12 dozen Snaths, 15 dozen Agricultural Forks, 12 dozen Handled Axes, 3 gross H. H. Goods, 247 Clocks, 23 dozen Edge Tools, 6 dozen Hammers, 8 dozen Saws, 36 Clocks, 24 dozen Axe Handles, 4 Wringers, 27 1/2 dozen Hardware, 17 Tools, 2 1/2 dozen Hoes, 1 Printing Machine, 1 Book-folding Machine, 4 dozen Hardware, 1 Typewriter, 10 dozen Printing Machine and parts, 40 pounds Printing Machine and parts.

By Arnold, Cheney & Co.—51,400 pieces Roofing Slate, 2 cases Printing Type and Presses, 4 cases Saws, 12 packages Plated-Ware, 4 cases Bolts, 5 cases Spokes, 49 cases Handles, 34 cases Handles, 120 cases Handles, 2 cases Handles, 15 packages Hardware, 14 cases Axes, 6 cases Velocipedes, 3 cases Hardware, 1 case Hardware, 9 cases Springs, 35 packages Hardware.

By W. H. Crossman & Bro.—30 dozen Churns, 18 dozen Axes, 4 Clocks, 16 dozen Axes, 30 dozen Whip Stocks, 2 dozen Carpet Sweepers, 1 case Tools, 9 dozen Rakes, 36 dozen Mouse Traps, 6 dozen Handles, 10 cases 1 barrel Hardware, 1 dozen Wringers, 6 dozen Pruning Shears, 2 dozen Lawn Mowers, 6 dozen Hammers, 36 dozen Lamp Goods, 1 gross Traps, 2 cases Hardware, 1 case Hardware, 1 case Sewing Machine, 18 dozen Wrenches, 2 Saws, 2 crates Dairy Fixtures, 1 case Tinsmiths' Tools, 12 cases Carpenters' Hardware, 1 case Hardware, 1 dozen Hog Rings, 8 cases Hardware, 1 gross Traps, 10 cases and 30 cases Pumps, 42 crates and 4 boxes Stoves, 6 dozen Axes, 8 dozen Braces, 19 cases Hardware, 12 dozen Clocks, 7 dozen Potato Hooks, 6 dozen Handles, 5 dozen Hog Rings, 60 feet Rubber Hose, 11 dozen Razor Strops, 5 Coffee Mills, 2 dozen Choppers, 9 dozen Cow Bells, 6 cases Hardware, 3 1/2 dozen Pruning Shears, 5 tons Barb Wire, 1 case Hardware.

PER BARK RACE HORSE, JANUARY 30, 1889, FOR
ADELAIDE, AUSTRALIA.

By H. W. Peabody & Co.—194 packages Hardware, 40 dozen Agate-Ware, 1 crate Sinks, 15 packages Lampware, 1 case Firearms, 32,000 Bolts and Nuts, 1 case Washers, 20 dozen Glue, 2 cases Clipping Machines, 504 pounds Nuts, 270 dozen Handles, 2 packages Agricultural Implements, 34 dozen Wringers, 11 packages Lawn Mowers, 8 packages Pumps, 10 cases Perambulators, 7 packages Skates, 44,890 pounds Barb Wire, 280 pounds Packing, 3 packages Stoves, 6 cases Chalk, 8 packages Lampware, 25 crates Stoves, 1 case Lampware, 42 packages Hardware, 5 reams Flint Paper, 204 dozen Handles, 4685 pounds Barb Wire, 4 packages Hardware, 1 bundle Lampware, 1 Refrigerator, 1 bundle Hardware, 150,000 Skewers, 4 cases Hardware, 8 cases Hardware, 11 packages Hardware, 108 dozen Handles, 7 cases Agate-Ware, 24 dozen Shade Rollers, 1/2 dozen Wringers, 3 cases Perambulators, 99 packages Stoves, 1 gross Axle Grease.

By Strong & Trowbridge.—251 cases Axes, 2 cases Whetstones, 10 cases Slaters, 40 cases Axes, 1 case Rules and Levels, 110 bundles Washboards, 2 cases Iron Toys, 7 cases Tinware, 1 case Hardware, 10 packages Choppers, 3 bales Rubber Hose, 6 packages Lampware, 3 cases Carriage-Ware, 29 cases Plow Castings, 1 case Carpet Sweepers, 1 box Steel, 70 cases Handles, 1 case Agricultural Machinery, 8 packages Agricultural Machinery.

By Reed & Barton.—2 cases Plated-Ware, 1 barrel Plated-Ware.

By Mailler & Quereau.—25 cases Agricultural Implements, 2 cases Wind Mill Repairs, 1 case Forks, 2943 pounds Axes, 25 dozen Axes, 25 dozen Axes, 1600 pounds Castings, 10 dozen Washboards, 3 cases Axe Handles, 5 gross Blacking, 1 case Broom Handles, 10 gross Blacking, 75 bundles Washboards, 2500 Broom Handles.

By McLean Bros. & Rigg.—30,000 Cartridges, 30,000 Primers, 3 gross Farers and Corers, 1 dozen Barometers, 1 gross Coat and Hat Hooks, 44 pairs Hinges, 3 1/2 dozen Seeders, 3 dozen Brackets, 315 dozen Handles, 24 dozen Handles, 2 Forges, 1 case Castings, 4 Wind Mills, 32 dozen Axes, 1 dozen Lemon Squeezers, 1/2 dozen Scales, 3640 pounds Axle Grease, 42 dozen Washboards.

By W. H. Crossman & Bro.—4 cases Hatchets, 1 case Hardware, 63 dozen Axes, 120 dozen Handles, 13 dozen Axes, 75 sets Springs, 3 cases, 57 bundles Carriage-Ware.

By White Sewing Machine Co.—5883 pounds Sewing Machines.

By Welsh & Lea.—8 cases Saws.

By Nevins & Haviland.—25 gross Shade Rollers.
 By R. W. Forbes & Son.—510 pounds Axle Grease, 12 gross Whips, 6 dozen Harness Dressings, 37 packages Sewing Machines, $\frac{1}{2}$ gross Harness Dressing, 1 box Hardware.
 By Meriden Britannia Co.—4 boxes Plated-Ware, 4 packages Plated-Ware, 4 boxes Plated-Ware, 3 boxes Plated-Ware, 2 boxes Plated-Ware.
 By Rogers, Smith & Co.—751 pounds Plated-Ware.
 By E. Miller & Co.—1 box Lamp Goods, 10 packages Lamp Goods, 25 packages Lamp Goods, 9 packages Lamp Goods, 11 packages Lamp Goods.
 By Arkell & Douglas.—1 case Handles, 3 cases Stone, 2 cases Harness, 31 cases Hardware.
 By J. A. Gifford.—95 packages Carriage-Ware.
 By Corner Bros. & Co.—2400 pieces Staves, 720 Butts.
 By Fairbanks & Co.—576 pounds Scales.
 By H. W. Hartman.—2464 pounds Nails.
 By Heywood Bros. & Co.—37 packages Hardware.
 By Russell & Erwin Mfg. Co.—5 cases Hardware.
 By Peck, Stow & Wilcox Co.—4 boxes Tin-smiths' Tools.
 By F. B. Wheeler & Co.—25 dozen Axes.

PER BARK MARY S. AMES, JANUARY 30, 1889,
 FOR PORT NATAL, SOUTH AFRICA.

By Arkell & Douglas.—24 Plows, 24 sets Spokes, 18 sets Fellos, 1 bundle Sash Cord, 3 gross Shade Rollers, 1020 pounds Sash Weights, 110 kegs Nails, 25 boxes Horse Nails, 5 dozen Barrows, 300 dozen Handles, 1 bundle Sash Cord, 2500 pounds Sash Weights, 5 cases Pumps, 35 boxes Horse Nails, 1 dozen Churns, 1 dozen Washing Machines, $\frac{1}{2}$ dozen Washing Machines, 30 dozen Brooms, 14 Agricultural Implements, 8 dozen Axes, 2 dozen Picks, 3 Stoves $\frac{1}{2}$ dozen Sewing Machines, 8 Corn Shellers, 1 dozen Meat Cutters, $\frac{1}{2}$ dozen Sausage Stuffers, 22 $\frac{1}{2}$ dozen Locks, 6 pairs Springs, 3 cases Agricultural Implements, $\frac{1}{2}$ dozen Corn Shellers, 3 dozen Barrows, 1 case Plow Parts, 3 dozen Axes, 77 barrels Fellos, &c., 2 dozen Hatchets, 4 Bells, 30 dozen Axes, 40 dozen Picks, 39 cases Plows, 180 dozen Brooms, 1 dozen Washing Machines, 60 dozen Tools, 153 cases Plows, 40 Plows, 600 feet Hose, 1 case Planes, 1 dozen Bench Screws, 4 dozen Saws, 3 dozen Rakes, 1 dozen Meat Cutters, 3 Sausage Stuffers, 1 dozen Forks, $\frac{1}{2}$ dozen Plows, 4 cases Fruit Jars, $\frac{1}{2}$ dozen Step Ladders, 5 dozen Axes, 3 dozen Traps, 3 gross Axle Grease, 20 cases Plows, 3 dozen Axes, 12 dozen Locks, 2 dozen Scales, 1 dozen Stoves, 6 dozen Saws, $\frac{1}{2}$ gross Traps, 23 cases Plows, 2 Forges, 500 feet Hose, 2 dozen Strops, 4 cases Hardware, 5 packages Pumps, 3 cases Hardware, 5 cases Pumps, 1 case Castings, 12 cases Plow Fittings, 72 Churns, 24 Plows, 80 dozen Brooms.
 By W. H. Crossman & Bro.—6 cases Hardware, 62 pounds Oil Stones, 1 case Hardware, 20 dozen Handles, 11 cases Hardware, 57 pounds Oil Stones, 100 pounds Nails, 9 dozen Hammers, 6 dozen Hoes, 2 dozen Axes, 7 dozen Hatchets, 1 dozen Barrows, 9 Churns, 35 dozen Handles, 20 Churns, 1 dozen Corn Shellers, 250 Handles, 11 Stove Trucks, 3 dozen Cultivators, 9 Corn Shellers, $\frac{1}{2}$ dozen Hay Cutters, $\frac{1}{2}$ dozen Mangles, 5 cases Hardware, 10 cases Hardware, 30 sets Axes, 9 Washers, 9 crates Wringers, 6 dozen Traps, 1 dozen Pumps, 2 dozen Axes, 15 dozen Hatchets, 30 Packages Carriage-Ware, 50 Trucks, 83 cases Plow Parts, 15 Hand Carts, 14 cases Slates, 3 Corn Shellers.

Tendencies in Trade.

Referring to the discussion which has been carried on in regard to the position of the jobbers as between the manufacturers and retailers, we have the following letter from one of the most prominent and experienced Hardware merchants of the West, whose views are entitled to especial weight:

I have read most of the letters you have published on "The Tendencies of Trade." These letters are conflicting; they are reflections of opinions of writers from the standpoint of self-interest—in many instances inspired by their personal wishes or aspirations.

It is a fact, doubtless, that at the present time there is a conflict going on between the old and the new manufacturers, the old ones, as a rule, adhering to the jobbing trade, the new cultivating the re-

tail trade. Sometimes this is on account of preference of jobbers for old brands, but more frequently by reason of two bodies attempting to occupy the same space at the same time, and invariably failing to do it. It is natural that the wholesalers should give preference to the brands which are well established rather than take up new ones which are unknown, and yet the letters on the subject are not free from statements to the contrary.

That goods can be more cheaply distributed through the jobbing houses admits of no denial, as the jobbing houses can advertise and sell hundreds of articles with one equipment of employees cheaper than hundreds of manufacturers can do the same thing with expenses of equipment hundreds of times repeated, so there can be no reasonable doubt about the permanence of wholesale jobbing houses located in the centers of trade.

The efforts to ignore established usages of trade are undertaken by the newer manufacturers for the purpose of dividing the trade with the older ones. Capital seems to be obtainable for almost any line of manufacturing, without reference to the amount already invested in it, on the mistaken theory that there is no limit to the demand for manufactured articles nor to the growth of the country, and that new men and methods will readily push out the old; but in most cases such theories and methods are disappointing. New methods are not necessarily improved ones, and therefore there are long periods of depression and only short periods of prosperity in manufacturing enterprises.

Until the actual requirements of the country can be closely estimated, and the manufacturing capacity kept more nearly in correspondence therewith, there will result unnatural and expensive competition, from which grows the discussion and conflict to which the letters referred to relate. To say that the wholesale jobbing trade will be permanently disturbed is to say that overproduction will be permanent, and that capital will continue to be wasted in the vain effort to make overproduction profitable.

In regard to the difficulty experienced by manufacturers in introducing their goods through jobbers, we have the following from a well-known Philadelphia house, in which they refer to their experience in this matter:

In reference to the trade between the manufacturers and retailers we have to say that our original intention when we started to manufacture our goods was to place them in the jobbers' hands for distribution, but as we found that jobbers were averse to explaining and introducing new goods we changed our plans and directed our attention to the retail trade. We are free to say that we think [this change benefited us, as when a retailer offers goods for sale he must thoroughly understand them and know in what points new goods are superior to old, &c., and no one can or will post him as thoroughly as the manufacturer. This does not apply to jobbers in the same measure, as their salesmen sell goods by name, number or on their reputation, and it is only necessary that they should have the "right" price in order to sell the goods and take the profit after they are introduced. We feel confident since our trade has been established direct with the retailer that the merits of our goods have been fully explained to each and every purchaser, and we propose to continue offering our goods in the same channel.

The Sparrowpoint Railroad, connecting Steelton, the Pennsylvania Steel Company's new manufacturing town, with Baltimore, has been completed, and trains will be run to Union Station next week.

New Departures.

The London *Ironmonger*, in its first issue of the present year, under the heading "New Year's Resolutions," refers in the following terms to such resolutions, so far as they relate to changes in business methods, new departures, increased enterprise, &c.:

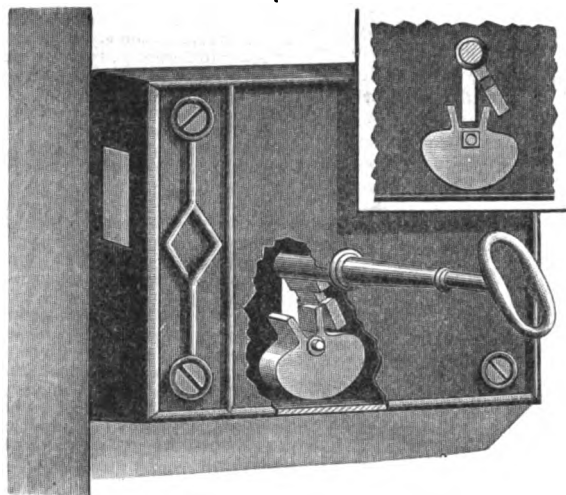
The majority of business men are given to sober reflections upon the possibilities of another year at its commencement, and most of them arrive at the conclusion to do something or other differently, to make some entirely new departure, or to leave something undone which had been done previously. They not only "take stock" of their tangible goods and chattels, but indulge in mental retrospects and prospects which may or may not have visible results in the year which has just commenced. It is good that such should be the case. There are few men or few businesses which are not capable of some improvement, and the beginning of another year is an appropriate time for that improvement to be inaugurated. The emendation may be in respect of vital principles, or it may merely refer to working details. It may involve absolutely new departures, and therefore unknown difficulties or unforeseen successes, or it may merely touch the fringe of existing practices, and mean neither risks nor gains of importance. Whatever its magnitude at the moment or future possibilities may be, however, it is obvious that the "good resolution" should be the outcome of grave deliberation and of careful thought. The majority of personal "good resolutions" made at this season of the year come to grief because they are made too hastily—conceived on the spur of the moment, and uttered in words or recorded in writing without due deliberation or proper consideration of all that they involve. In business affairs there is probably less danger of these untoward results, if only because the business instinct in most men is better trained and in better subjection than the mere personal likes and dislikes. That there is room for "good resolutions" in respect of most businesses is pretty certain. Some concerns are so well organized throughout that there is really very little room for profitable change or improvements, but we fancy that in the majority of medium and smaller grades of businesses there is ample room for "good resolutions" in respect of general organization, regularity, enterprise and the working out of details. Bookkeeping and balancing accounts, to select an odd instance, are not always so perfect as they might be, and the quantity of old stock on hand is not so satisfactory as would have been the case had last year's management and buying-in been conducted on a better basis. The display of goods, to take another example, might also be done much better in hundreds of ironmongers' shops, and the general arrangement of the interiors of such establishments is probably capable of considerable improvement. These, with many other points, will suggest themselves to any man who is really desirous of keeping pace with the times and developing his business. They are all good subjects for "new year's resolutions," and will, we trust, be so thought out as to yield excellent results during 1889.

The trade resources of Venezuela are highly extolled by Mr. Scott, United States Minister to that country, who recently arrived in New York City from Curacao. Referring to the probability of closer connections in the future between Venezuela and the United States, he said: "Venezuela would afford a magnificent outlet for American trade. They are in need of all American products and machinery there. They have none whatever and know nothing about them. They would have to be taught how to use our machinery, but once they were made to see the advantages of it well the country would become a magnificent market for them, especially ice-making machinery. But Congress would have to send a commission there to secure substantial guarantees, because each succeeding administration repudiates all agreements of their predecessors. Without arrangements of the character referred to Mr. Scott would not advise Americans to assume risks in that country. The actual ruler is Guzman Blanco, who dictates the policy of the country.

There is some talk of a new wire rod mill in Eastern Pennsylvania.

Paulmier's Patent Key Fastener.

This ingenious contrivance applied to a lock, manufactured by S. H. Paulmier, Madison, N. J., is represented in the accompanying illustration, which indicates its utility. From this it will be seen that inside the lock, in the position shown in the small cut to the right, a gravity guard

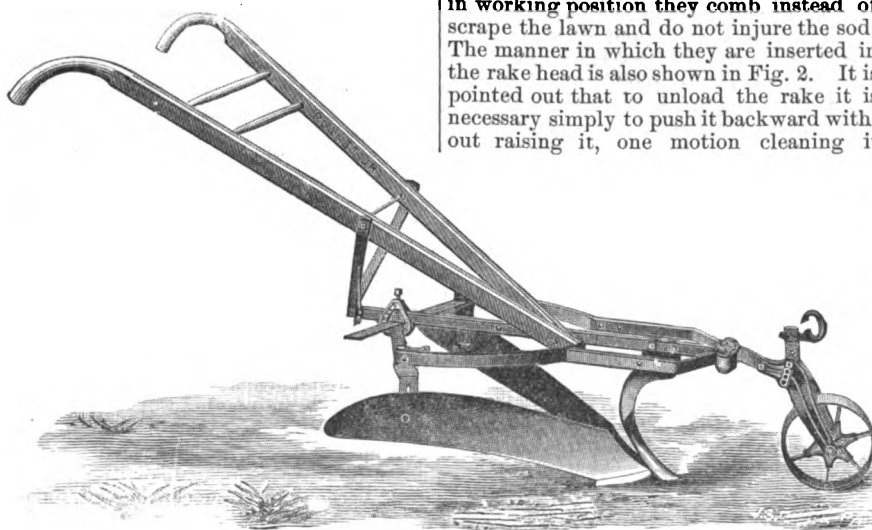


Paulmier's Patent Key Fastener.

is placed so constructed as to permit the unobstructed entrance of the key, while the key, after it has been turned in the lock, is turned by the pressure of the guard to one side or other of the keyhole, so that it is not liable to drop out on the jarring of the door, an annoyance which, with other locks, is often troublesome. The simplicity of the device and the efficiency with which it does its work, as well as its comparative inexpensiveness, are points that are made in its favor.

The Planet, Jr., Celery Earther.

This machine is manufactured by S. L. Allen & Co., 127 and 129 Catherine street, Philadelphia, Pa. Its general features are indicated in the illustration herewith given. It will be seen that it narrows or widens to suit rows from 18 inches to 4 feet apart, and the rear ends of the wings can be used low at first earthing and



The Planet, Jr., Celery Earther.

raised as the season advances and the celery attains larger size. It is referred to as working best immediately after the cultivator has loosened the soil and made it fine. It is referred to as also useful in hilling potatoes and other crops in a

similar manner. Sweet potatoes especially, it is said, can be bedded or hilled up very neatly.

The Canton Lawn Rake.

This rake, illustrated herewith, is manufactured by the Gibbs Lawn Rake Company, Canton, Ohio, for whom John H.

Graham & Co., 118 Chambers street, New York, are agents, and is designed to meet the demands of the trade for a cheap, light, durable and efficient rake, embodying the important features of their Gibbs lawn rake, which has met with such favor. From Fig. 1 it will be seen that the form of the teeth is such that when the rake is

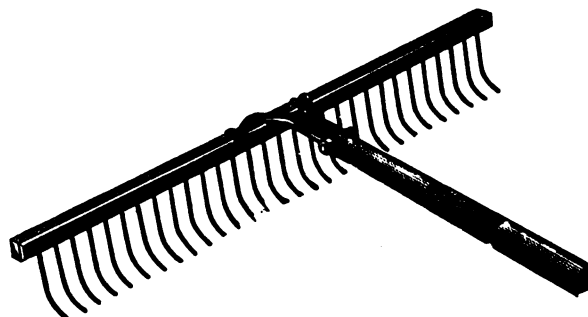


Fig. 1.—The Canton Lawn Rake.

in working position they comb instead of scrape the lawn and do not injure the sod. The manner in which they are inserted in the rake head is also shown in Fig. 2. It is pointed out that to unload the rake it is necessary simply to push it backward without raising it, one motion cleaning it

The First Railway in China.

Shanghai correspondents describe the successful opening in August last of a railway 86½ miles in length, from Tientsin and the port of Taku to the coal region where the Kaiping mines are located. The Viceroy officially inspected the line, which is operated on the American system, and at various stations officials met the train arrayed in colored silks, firing salutes in honor of the distinguished visitor. The ovation tendered differed widely from the scenes witnessed some years ago, when the unfortunate Shanghai-Woo-Sung line was torn up and thrown into the sea. It is predicted that this new road will eventually introduce one of the



Fig. 2.—Manner of Inserting Teeth.

largest and most profitable railway systems in the world. The line just completed was built under the superintendence of C. W. Kinder, well known in England and America, and comprises some fine specimens of engineering work. One of the bridges is across the Peh-tang River, which consists of one swing span 60 feet wide, ten of 50 feet, and five of 30 feet, in all 720 feet of iron, with iron girders and stone abutments. Altogether this bridge will compare favorably with any in America or England. There are many other splendid bridges among the 50 along the

line, one especially at a place called Chung-Hang-Chang, built in America, and forming a very handsome, light, though strong, structure, with a span of 40 yards, which can be widened by a peculiar arrangement to admit a double line when it becomes necessary. Of the four engines running one was obtained from America. Already an immense and paying goods traffic has been developed, and bales of foreign piece goods may be seen transported on the railway and reaching their destination for distribution in a few hours, where a few months ago they only arrived after as many days' travel in cargo boats, or on mules and camels.

The three commercial exchanges of Philadelphia have organized a permanent committee of five to foster the commerce of that port. No concealment is attempted of the fact that the foreign trade of Philadelphia is in a state of decadence. Exports of wheat, for example, declined from more than 9,000,000 bushels in 1887 to about 2,500,000 in 1888, 20 per cent. more than in Baltimore in the same period.

An adjourned meeting of the New England Water Works Association will be held at Young's Hotel, Boston, on Wednesday, February 13.

Drop-Forged Tack Claw.

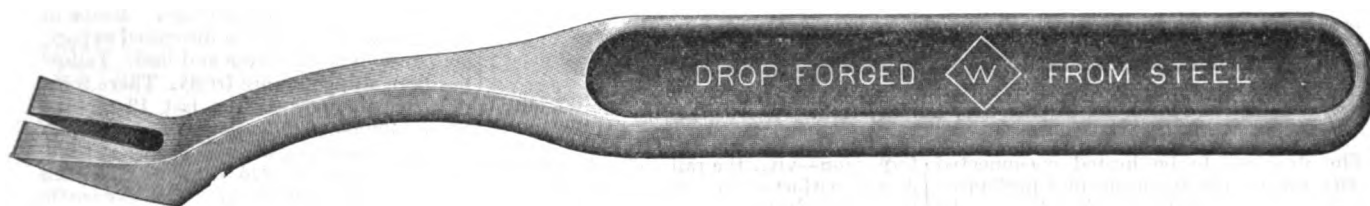
J. H. Williams & Co., 9 to 15 Richards street and 8 to 26 Bowne street, Brooklyn, N. Y., have recently added to their line of drop forgings a tack claw, which is represented full size in the accompanying illustration. It is forged from steel and tempered, its form and the shape of the handle being shown in the cut. Attention

carriage. It costs about \$10,000 to erect it. The testing of the Thurlow, Pa., steel gun, at the naval proving grounds, will take place about the middle of February.

New Spring Hinge.

The new spring hinge illustrated herewith and recently placed on the market by the Henry C. Hart Mfg. Company, De-

troit, Mich., is designated as the Reliable No. 20 Surface Spring Hinge, and embodies some new features in construction as well as in design. Its principal point of difference from other hinges of the same character is that the manufacturers have substituted for the usual coiled wire springs a flat spring made of tempered steel and concealed by the leaves of the hinge. The advantage of this flat steel spring over the coiled wire spring is that it takes up very little space and is completely protected from the weather. It is

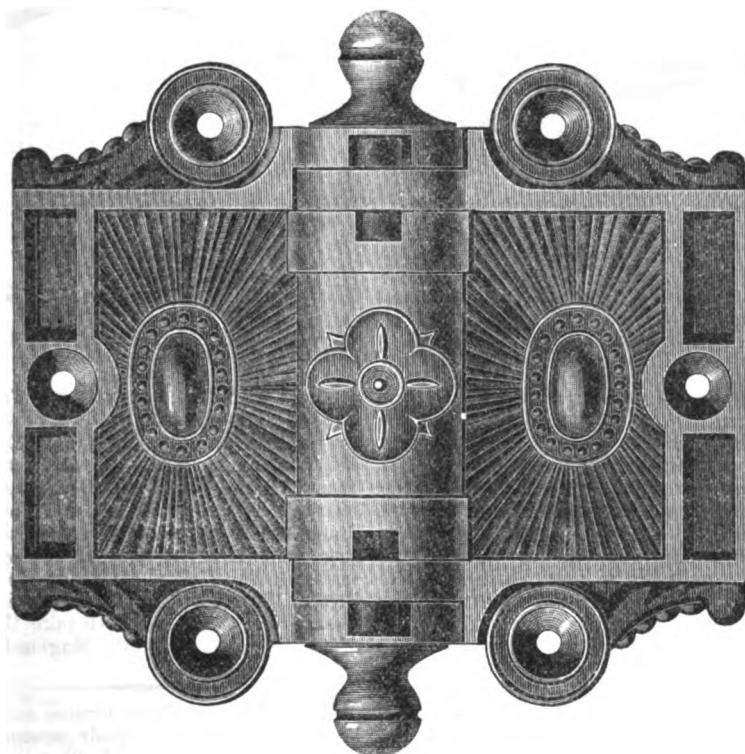
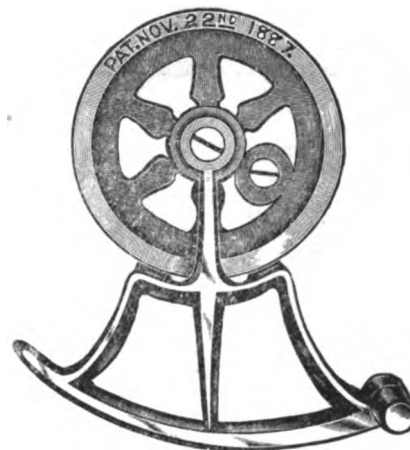
*Drop Forged Tack Claw.*

is called to the shape of the claw as especially adapted to the work for which it is intended, the satisfactory leverage which is secured in lifting the tack, and the fact that the handle is concaved on both sides, thus giving the requisite strength and a good grip without unnecessary weight. Besides the convenience of the form, the fact that there is no handle or ferrule to work loose, and the durability of the tool, are points which are made in regard to it. It is offered to the trade at a price which permits its being retailed at 25 cents, and

give particular attention to the cheap production of steel on a small scale.

The Howard Door Check.

The accompanying illustration represents a very simple device for holding a door open at any angle. It is intended to be screwed on the door, near the bottom, so that the swinging arm can touch the floor. One screw fastens it to the door. When not in use the arm is turned upward, a lug on the side of the wheel preventing it from revolving completely around. It can be thrown into position to hold the door by a touch of the toe. The arm being slightly eccentric in shape, it can be made to press as tightly against the floor

*New Spring Hinge.**The Howard Door Check.*

as possible. But one size is made, and it has a total spread of 4½ inches. It is constructed of malleable iron, handsomely polished, and nicked. The sale agents are H. H. and C. L. Munger, 142 Lake street, Chicago.

it is expected that this comparatively low price for an article of its excellence will insure for it an extensive sale.

Representatives of the South Boston Iron Works are engaged at the naval proving ground, opposite Annapolis, in placing in position a pneumatic gun carriage, on which to test the regulation 8-inch steel gun. The carriage is to be worked with compressed air, and it is claimed that by this method a great saving would take place as against the ordinary gun carriages now in use, as one person can manipulate the improved pattern, whereas four or five persons would be required for the old-style carriage. Should the experiment prove satisfactory, it is said the Government will very likely adopt the new style

described as made from the best quality of material, carefully tempered, thus giving an advantage over the wire springs, which are apt to vary in hardness and elasticity. The hinge is so constructed as to throw the door either open or shut. The weight of the door is referred to as supported by the knuckles of the hinge. The manufacturers refer to the hinge as meeting with favor wherever offered, and from its attractive appearance and durability likely to meet with a large demand.

L. G. Laureau has disposed of his interest in the firm of Gordon, Strobel & Laureau, and has opened an office in the Brown Building, Fourth and Chestnut streets, Philadelphia. Mr. Laureau is prepared to give advice on all matters relating

The associations of millers in the Northwest, representing the winter wheat and spring wheat sections, respectively, are contemplating a "campaign in favor of American flour." Attention will be directed particularly against Cuba and Brazil. The millers propose to make a systematic attempt to shut out Cuban sugar and tobacco unless American flour is admitted on the same basis as that of other countries. In Brazil English mills and English capital are being encouraged by the imposition of an import duty on American flour, while wheat is admitted free, and the winter and spring wheat associations propose to amalgamate under the organization of the national association to retaliate, if possible, by shutting out Brazilian coffee.

The Gem Curling Iron.

A new curling iron is illustrated herewith, which is intended for curling or frizzing hair. This is not entirely devoted to female vanity, as two sizes are made, the small size, or Little Gem, being intended for curling gentlemen's mustaches. It is made of steel, with a wooden handle.

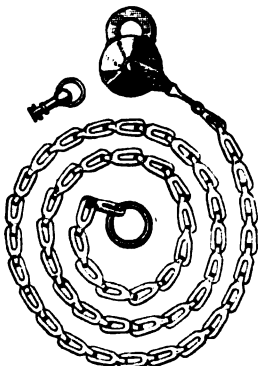


The Gem Curling Iron.

The steel rod to be heated is connected with the handle by means of a perforated tube or air chamber, which lessens the transmission of heat to the handle, keeping it always cool. The action of the cresp is regulated by a strong spring, and it is operated by a wooden button, which is also thus constructed to prevent the transmission of heat to the thumb or finger. It is very light, easily manipulated and inexpensive. The manufacturer is G. L. Thompson, 86 Market street, Chicago, and it is sold to the jobbing trade by H. H. & C. L. Munger, 142 Lake street.

Baggage Protector.

The illustration given below represents a baggage protector made by the Ames Sword Company, Chicopee, Mass. The chain is 31 inches in length. The lock is a $\frac{1}{2}$ -inch padlock with six levers. It is in-



Baggage Protector.

tended for securing hand baggage in railroad cars, fastening bicycles, &c. It will be seen that there is a clevis-drop fastened through the center of the padlock which turns easily upon it and to which the chain is attached. The goods are furnished either in brass or nickel plated.

The Baldwin Locomotive Works have recently sent to the National Museum, at Washington, a miniature model of the locomotive "Old Ironsides," which was built by Matthias Baldwin in 1832. This was the first locomotive built by Baldwin. The workmanship is in all respects a perfect reproduction of the original. An inscription on the model states that this locomotive made 60 miles an hour. This was of course for but very short distances. In the same collection, illustrating the history of the locomotive, is the original John Bull.

Judge Brewer's decision in the Chicago, Burlington and Quincy case dissolving the preliminary injunction against the Iowa Railroad Commissioners covers the case of the Chicago, Milwaukee and St. Paul. The Chicago *Tribune* says of Judge Brew-

er's decision: "The new rates are to be enforced, but there is no danger that hardship will be inflicted on the railroads. The law which the carriers have been fighting provides that rates may be abandoned whenever it is proved that they are unreasonably low, and the burden of making such proof is properly placed on the parties that alone can furnish the needed in-

formation—viz., the railroads themselves. A rate adjusted to give returns on pretended capital never actually invested is unreasonably high and extortionate."

Crimper and Extractor.

Bailey, Farrell & Co., Pittsburgh, Pa., are about to put on the market a shot-shell crimper and extractor combined, which is shown in the accompanying illustration, Fig. 1. It is named the Eureka Fig. 2 represents a loaded cartridge and the style of crimp made by the crimper. The circular of the company refers to the fact that many sportsmen load their shell with two or

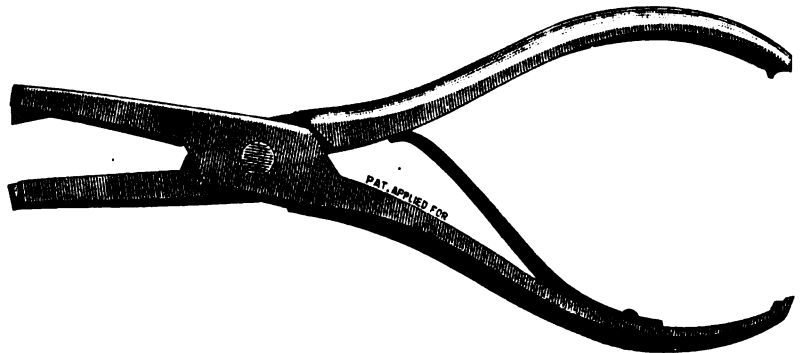


Fig. 1.—Eureka Crimper and Extractor.

three wads one size larger than the bore of the gun, the object being to retard the powder at the moment of explosion and obtain greater pressure, and thus get better penetration and pattern, and they make the point that by using one wad only on the powder and crimping the shell above this wad with the Eureka crimper the same pressure can be brought against the powder with as desirable results, at the same time economizing wads and gaining capacity in the shell for larger loads, or the charge generally used in a 10-bore can be shot out of a 12-bore. This implement crimps all sizes of paper shot shells from No. 20 to No. 8 rapidly, and with the exercise of little power. The weight is 4

confined almost exclusively to England. For petroleum and its products the whole world is the market. Germany, England, Belgium, Netherlands, British East Indies, Japan, China, Brazil and British Australasia taking the lead in the order mentioned. For cotton, England is the only large consumer, Germany and Belgium excepted. The United States of Colombia, British West Indies, Hayti, British Possessions in Africa and Chili take the bulk of the refined sugar trade, England always excepted.

New York business circles receive an important accession to their personnel from the retiring members of Cleveland's ad-

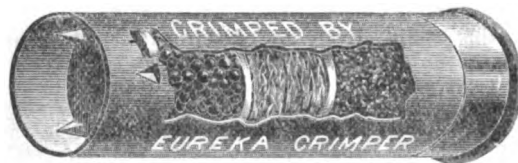


Fig. 2.—Shell Crimped by Eureka Crimper.

ministration. The utility of the crimper for crimping blank shot-gun cartridges loaded with powder and wads only is referred to in the manufacturers' descriptive circular.

Exports of American manufactured cottons from San Francisco to China, which exceeded 12,000,000 yards during the year 1887, have been entirely diverted by the Canadian railroads and Vancouver route.

Mr. Cleveland becomes partner in a law firm, and ex-Comptroller Trenholm becomes president of a security company. Secretary Fairchild and Daniel S. Lamont, Cleveland's private secretary, become officers in a new trust company in this city, associated with Roswell P. Flower and others. Mr. Whitney will also reappear in the ranks of New York's active citizens.

CURRENT HARDWARE PRICES.

FEBRUARY 6, 1889.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers, at the figures named.

Ammunition.—

Caps, Percussion, 1000—	
Hicks & Goldmark, 1000—	
F. L. Waterproof, 1-10's.....	50¢
E. B. Trimmied Edge, 1-10's.....	65¢
E. B. Grnd. Edge, Cent. Fire, 1-10's.....	70¢
Double Waterproof, 1-10's.....	50¢
Musket Waterproof, 1-10's.....	50¢
G. D.....	25¢
S. B.....	30¢
Union Metallic Cartridge Co.	
F. O. Trimmied.....	50¢
F. L. Ground.....	65¢
Cent. Fire Ground.....	70¢
Dbl. Waterproof.....	1.40
Dbl. Waterproof, in 1.10's.....	1.40
A. B. Genuine Imp.orted.....	45¢
Eley's E. B.....	54¢
Eley's D. Waterproof, Central Fire.....	1.60

Cartridges.	
Rim Fire Cartridges.....	50¢
Rim Fire Military.....	15¢
Cent. Fire Pistol and Rifle.....	25¢
Cent. Fire, Military and Sporting.....	15¢

Blank Cartridges, except 22 and 32 cal., additional 10¢ on above discounts.	
Blank Cartridges, 32 cal.....	1.75
Blank Cartridges, 32 cal.....	3.50
Primed Shells and Bullets.....	15¢
B. B. Caps, Round Ball.....	1.75
B. B. Caps, Con. Ball, Swgd.....	2.25

Primers.	
Berdan Primers.....	1.00
B. L. Caps (for Sturtevant Shells).....	1.00
All other Primers.....	1.20

Shells.	
First quality, 4, 8, 10 and 12 gauge.....	25¢
First quality, 14, 16 and 20 gauge (10 list).....	30¢
Star, Club, Rival and Climax brands, 10 and 12 gauge.....	35¢
Club, Rival and Climax brands, 14, 16 and 20 gauge.....	30¢
Seibold's Comb. Shot Shells.....	15¢
Brass Shot Shells, 1st quality.....	60¢
Brass Shot Shells, Club, Rival, Climax.....	65¢
I. X. L. 10 and 12 gauge.....	40¢
"Special," 16 gauge.....	30¢
"Special," 10 and 12 gauge.....	40¢
Powder's Pat.....	35¢

Shells Loaded—	
A. M. Co. List No. 19, 1887.....	20¢

Wads—	
U. M. C. & W. R. A.—B. E., 11 up.....	32¢
U. M. C. & W. R. A.—B. E., 9&10.....	2.30
U. M. C. & W. R. A.—B. E., 7&8.....	2.60
U. M. C. & W. R. A.—P. E., 11 up.....	3.10
U. M. C. & W. R. A.—P. E., 9&10.....	4.00
U. M. C. & W. R. A.—P. E., 7&8.....	4.90
Eley's B. E., 11 up.....	1.75
Eley's P. E., 11 up.....	2.50

Anvils.—	
Eagle Anvils.....	10¢
Peter Wright's.....	95¢
Armstrong's Mouse Hole.....	84¢
Armstrong's Mouse Hole, Extra.....	1.10
Trenton.....	1.10
Wilkinson's.....	1.10
J. & Riley Carr. Pat. Solid.....	1.10
Moore & Barnes Mfg. Co.....	33¢

Anvil Vice and Drill—	
Miller Falls Co.....	13.00
Cheney Anvil and Vice.....	20¢
Allen Combined Anvil and Vice.....	33.00
dis 40&10¢	

Apple Parers—

Advance.....	7¢
Antrim Combination.....	5.50
Baldwin.....	5.25
Champion.....	5.25
Eureka, 1888.....	17.00
Family Bay State.....	12.00
Gem.....	5.25
Gold Medal.....	4.00
Hudson's New '88.....	3.75
Ideal.....	4.75
Improved Bay State.....	30.00
Little Star.....	8.00
Monarch.....	13.50
New Lightning.....	5.50
Orion.....	4.00
Penn.....	4.00
Perfection.....	4.00
Pomona.....	4.00
Rocking Table.....	6.00
Turntable.....	4.50
Victor.....	13.50
Waverly.....	4.50
White Mountain.....	4.50
72.....	4.25
75.....	4.25
78.....	4.50

Augers and Bits—

Douglas Mfg. Co.....	
W. A. Ives & Co.....	70¢
Humphreysville Mfg. Co.....	
French, Swift & Co. (F. H. Beecher).....	55¢
Cook's, Douglas Mfg. Co.....	50¢
Cook's, N. H. Copper Co.....	50¢
Ives' Circular Lip.....	80¢
Patent Solid Head.....	30¢
C. E. Jennings & Co., No. 10, extension lip.....	40¢
C. E. Jennings & Co., No. 30.....	60¢
C. E. Jennings & Co., Auger Bits, 3 set, 324 quarters, No. 5, 35; No. 30, 35; dis 20¢	
Lewis' Patent Single Twist.....	45¢
Jennings' Augers and Bits.....	35¢
Imitation Jennings' Bits.....	60¢
Pugh's Black.....	20¢
Car Bits.....	50¢
L'Hommiedieu Car Bits.....	15¢
erstner Pat. Auger Bits.....	10¢

Hollow Augers—

Ives'.....	55¢
French, Swift & Co.....	10¢
Douglas.....	40¢
Bouney's Adjustable.....	40¢
Stearns.....	30¢
Ives' Expansive, each \$1.50.....	50¢
Universal Expansive, each \$4.50.....	20¢
Wood's.....	25¢

Expansive Bits—

Clarke's small, \$18; large, \$26.....	35¢
Ives' No. 4.....	30¢
Swan's.....	40¢
Stearns, No. 1, \$25; No. 2, \$22.....	35¢
Stearns' No. 2, \$48.....	20¢

Gimlet Bits—

Common.....	25¢
Diamond.....	1.10
"Bee".....	25¢
Double Cut, Shephardson's.....	45¢
Double Cut, Ct. Valley Mfg. Co.....	30¢
Double Cut, Hartwell's.....	35¢
Double Cut, Douglas.....	40¢
Double Cut, Ives.....	60¢

Bit Stock Drills—

Morse Twist Drills.....	50¢
Standard.....	50¢
Cleveland.....	50¢
Syracuse, for metal.....	50¢
Syracuse, for wood (wood list).....	30¢
Williams' or Holt's, for metal.....	10¢
Williams' or Holt's, for wood.....	40¢

Ship Augers and Bits—

L'Hommiedieu's.....	15¢
Watrous'.....	15¢
Snell's.....	15¢
Snell's Ship Auger Pat'n Car Bits.....	15¢

Awl Hafts—	
Sewing, Brass Fer.....	35¢
Pat. Sewing, Short.....	1.00
Pat. Sewing, Long.....	1.30
Pat. Sew, Plain Top.....	10.00
Pat. Sew, Leather Top.....	12.00

Awls, Brad Sets, &c—

Awls, Sewing, Common.....	1.70
Awls, Should. Peg.....	2.25
Awls, Pat. Peg.....	65¢
Awls, Shouldered Brad.....	2.70
Awls, Handled Brad.....	7.50
Awls, Handled Scratch.....	7.50
Awls, Socket Scratch.....	1.50

Awl and Tool Sets—

Alken's Sets, Awls and Tools, No. 30.....	10.00
Fray's Adj. Tool Hds., No. 1, 12; 2, 18; 3, 24; 4, 30; dis 25¢	
Miller's Falls Adj. Tool Hds., No. 1, 12; 2, 18; 3, 24; 4, 30; dis 25¢	
Henry's Combination Haft.....	6.50
Brad Sets, No. 42, 10.50; No. 43, 12.50; dis 70¢	
Brad Sets, Stanley's Excelsior.....	1.00
No. 2, 4.00; No. 3, 4.50, dis 30¢	

Axes—

Makers' and Special Brands—

First quality.....	5.00
Others.....	5.50

||Axle Grease—

Fraser's.....	4¢
Fraser's, in boxes.....	5¢
Dixon's Everlasting, in bxs.....	1.30
Dixon's Everlasting.....	1.10
Lower grades, special brands.....	5.50

Axles—

No. 1.....	4¢
No. 7 to 18.....	50¢
No. 19 to 22.....	60¢
National Wrought Steel Tubular Self-Oiling.....	1.00
Special Farm (A1 to A5).....	3.00
Less than 10 sets.....	3.50
Over 10 sets.....	3.50

Bag Holders.—

Sprengle's Pat.....	18¢
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Balances—

Spring Balances.....	50¢
Common 24-lb.....	1.50
Chatillon's Spring Balances.....	50¢
Chatillon's Circular Spring Balances.....	50¢

Bells—

Hand—

Light Brass.....	70¢
Extra Heavy.....	80¢
White Metal.....	10¢
Swire Chime.....	33¢
Globe (Cone's Patent).....	25¢

Door—

Gong, Abbe's.....	33¢
Gong, Yankee.....	45¢
Gong, Barton's.....	40¢
Crank, Taylor's.....	25¢
Crank, Brooks.....	50¢
Crank, Cone's.....	10¢

Crank, Connel's.....	20¢
Lever, Sargent's.....	60¢
Lever, Taylor's Bronzed or Plated.....	25¢
Lever, Taylor's Japanned.....	25¢
Lever, R. E. M. Co's.....	50¢
Pull, Brook's.....	50¢
Pull, Western.....	25¢

Cow—

Common Wrought.....	60¢
Western.....	20¢
Western, Sargent's list.....	70¢
Kentucky, "Star".....	70¢
Kentucky, Sargent's list.....	70¢
Dodge, Genuine Kentucky.....	70¢
Texas Star.....	50¢
Call.....	40¢
Farm Bells.....	3¢
Steel Alloy Church and School Bells.....	40¢

Bellows—

Blacksmiths'.....	50¢
Molders'.....	40¢
Hand Bellows.....	40¢

Belting, Rubber—

Common Standard.....	70¢
Standard.....	70¢
Extra.....	60¢
N. Y. B. & P. Co., Carbon.....	60¢
N. Y. B. & P. Co., Diamond.....	50¢

Bench Stops—

Morrill's.....	20¢
Hotchkiss'.....	25¢
Weston's, No. 1, \$10; No. 2, \$9.25.....	10¢
McGill's.....	25¢

Bits—

Auger, Gimlet, Bit Stock, Drills, &c., see Augers and Bits.	
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Bit Holders—

Extension, Barber's.....	15.00
Extension, Ives.....	20.00
Diagonal.....	34.00
Angular.....	24.00

Blind Adjusters—

Domestic.....	3.00
Excelsior.....	10.00
Washburn's Self-Locking.....	20¢

Blind Fasteners—

MacKrell's.....	1.00
Van Sand's Screw Pat.....	15¢
Van Sand's Old Pat.....	15.00
Washburn's Old Pattern.....	5.00
Washburn's.....	5.00
Marshall's.....	5.00
Austin & Eddy No. 2008.....	5.00
Security Gravity.....	5.00

Blind Staples—

Barbed, 1/2 in. and larger.....	7¢
Barbed, 3/4 in.....	8¢

Blocks—

Cleveland Block Co., Mal. Iron.....	50¢
Novelty Tackle Blocks, Mal. Iron.....	50¢

Belts—

Door and Shutter—

Cast Iron Barrel, Square, &c.....	70¢
Cast Iron Shutter Bolts.....	70¢
Cast Iron Chain (Sargent's list).....	65¢
Ives' Patent Door Bolts.....	60¢
Wrought Barrel.....	70¢
Wrought Square.....	70¢
Wrt Shutter, all Iron, Stanley's.....	60¢
Wrt Shutter, Brass Knob.....	40¢
Wrt Shutter, Sargent's list.....	60¢
Wrt Sunk Flush, Sargent's list.....	55¢
Wrt Sunk Flush, Stanley's list.....	50¢
Wrt B.K. Flush, Com'n.....	55¢

Carriage, Machine, &c.—

Com. list June 10, '84.....	75¢
Genuine Edge, list Oct '84.....	75¢
Phila. pattern, list Oct 7, '84.....	75¢
R.B. & W., old list.....	70¢
Machine, according to size.....	75¢
Bolt Ends, according to size.....	75¢

Tire—

Common, list Feb. 28, '83.....	70¢
P.C.B. & N. Co., Empire, list Feb 28, '83.....	70¢
P.C.B. & N. Co., Phila., list Oct. '84.....	82¢
P.C.B. & N. Co., Keystone, Philadel., list Oct. '84.....	80¢
P.C.B. & N. Co., Norway, Philadel., list Oct. '84.....	75¢
Am.S. Co., Norway, Phil., list Oct. 16, '84.....	75¢
Am.S. Co., Eagle, Phil., list Oct. 16, '84.....	80¢
Am.S. Co., Philadel., list Oct. 16, '84.....	82¢
Am.S. Co., Bay State, list Feb. 28, '83.....	70¢
R.B. & W. Philadel., list Oct. 16, '84.....	82¢
R. & E. Mfg. Co.....	70¢

Stove and Plow—

Stove.....	62¢
Plow.....	80¢
Am. S. Co. Stove, Annealed.....	62¢
R. B. & W. Plow.....	65¢
R. B. & W. Stove.....	62¢
R. & E. Mfg. Co., Stove.....	62¢

Boring Machines—

Without Augers.....	7.00
Augers, Upright, Angular, Dia. 5.....	6.75
Douglas.....	5.50
Snell's, Rice's Pat. 5.50.....	6.75
Jennings.....	5.50
Other Machines.....	2.35
Phillips' Patent with Augurs.....	7.00

Bow Pins—

Humason, Beckley & Co's.....	60¢
Sargent & Co's.....	17¢
Peck, Stow & W. Co.....	50¢

Braces—

Barber's,	
Nos. 10 to 16.....	50¢
Nos. 30 to 33.....	50¢
Nos. 40 to 63.....	50¢
Barker's,	
Nos. 8, 10 and 12.....	75¢
Plated, Nos. 8, 10 and 12.....	65¢
Osgood's Ratchet.....	40¢
Spofford's.....	50¢
Ives' New Haven Novelty.....	70¢
New Haven Ratchet.....	60¢
Barber Ratchet.....	60¢
Barbers.....	60¢
Spofford.....	60¢
Common Ball, American.....	\$1.10
Bartholomew's,	
Nos. 25, 27 and 30.....	50¢
Nos. 117, 118, 119.....	70¢
Amidon's,	
Barker's Imp'd Plain.....	75¢
Barker's Imp. Nickeled.....	75¢
Ratchet.....	75¢
Eclipse Ratchet.....	80¢
Globe Jawed.....	40¢
Corner Brace.....	40¢
Universal, 8 in., \$2.10; 10 in.....	2.25
Buffalo Ball.....	\$1.10
P. S. & W.....	50¢

Cards—

Horse & Curry.....	10¢10¢10¢10¢10¢
Cotton.....	New list, Aug., 1888,
Wool.....	10¢10¢10¢
	New list, Aug., 1888,
	10¢10¢10¢

Carpet Stretchers—

Cast Steel, Polished.....	¢ doz \$2.25
Cast Iron, Steel Points.....	¢ doz \$0.4
Socket.....	¢ doz \$1.75
Bullard's.....	25¢25¢10¢

Carpet Sweepers—

Bissell No. 5.....	¢ doz \$17.00
Bissell No. 7 New Drop Pan.....	¢ doz \$19.00
Bissell, Grand.....	¢ doz \$28.00
Grand Rapids.....	¢ doz \$24.00
Crown Jewel, No. 1, \$18.00; No. 2,	\$19.00; No. 3, \$20.00
Magis.....	¢ doz \$15.00
Jewel.....	¢ doz \$17.00
Improved Parlor Queen, Nickel	¢ doz \$27.00
Excelsior.....	¢ doz \$24.00
Garland.....	¢ doz \$18.00
Parlor Queen.....	¢ doz \$24.00
Housewife's Delight.....	¢ doz \$15.00
Queen, with band.....	¢ doz \$18.00
King.....	¢ doz \$30.00
Weed, Improved.....	¢ doz \$18.00
Hub.....	¢ doz \$16.00
Cog-Wheel.....	¢ doz \$18.00
Conqueror.....	¢ doz \$22.00
Easy.....	¢ doz \$22.00
Monarch.....	¢ doz \$22.00
Goshen.....	¢ doz \$21.00
Advance.....	¢ doz \$18.00
Ladies' Friend, No. 1, ¢ doz,	\$15.00; No. 2,
American.....	¢ doz \$18.00
Grand Republic.....	¢ doz \$15.00

Cartridges—

See Ammunition.

Casters—

Bed.....	New list:
Plate.....	Brass.....55¢55¢55¢
Shallow Socket.....	Others.....60¢60¢60¢
Deep Socket.....	40¢10¢
Yale Casters, list May, 1888.....	30¢10¢40¢
Yale, Gem.....	60¢60¢60¢
Martin's Patent (Phoenix).....	45¢10¢50¢
Payson's Anti-friction.....	60¢60¢10¢
"Giant" Truck Casters.....	10¢10¢5
Stationary Truck Casters.....	45¢10¢

Cattle Leaders—

Humason, Beckley & Co.'s.....	70¢
Sargent's.....	60¢60¢10¢
Hotchkiss.....	30¢
Peck, Stow & W. Co.....	50¢10¢

Chain—

Trace, 6½-10-2, exact, ¢ pair,	\$1.03
Trace, 6½-10-3, exact, ¢ pair,	\$2.50
Trace, 7-10-2, exact, ¢ pair,	\$1.11
Trace, 7-10-3, exact, ¢ pair,	\$2.50
NOTE—Traces, "Regular" sizes, ¾ net	pair less than exact.
Log, Fifth, Stretcher, and other fancy	Chains, list Nov. 1, 1888
	50¢10¢50¢10¢5

American Coll.....	3-16 5-16 ¾
In cask lots.....	\$5.75 6.25 5.00 4.50
American Coll.....	7-16 ¾
In cask lots.....	\$4.40 4.00 3.75 3.50
Less than cask lots, add ¼¢ per lb.	
German Coll, list of June 20, 1887	50¢10¢50¢60¢

German Halter Chain, list of June 20,	1887.....50¢10¢50¢60¢
Covert Halter, Hitching and Breast	50¢25¢

Covert Traces.....	35¢25¢
Onsida Halter Chain.....	60¢60¢5
Galvanized Pump Chain.....	¢ 5½¢25¢
Jack Chain, Iron.....	75¢75¢5
Jack Chain, Brass.....	70¢70¢5

Chalk—

White.....	¢ gr 50¢
Red.....	¢ gr 70¢
Blue.....	¢ gr 80¢
White Crayons.....	¢ gr 12¢12¢12¢, dia 10¢

Chalk Lines—

See Lines.

Chisels—

Socket Framing and Firmer.....	
P. S. & W.....	
New Haven.....	
Wetherby.....	75¢50¢75¢10¢
Mix.....	
Ohio Tool Co.....	
Buck Bros.....	30¢
Merrill.....	50¢10¢60¢10¢5
L. & I. J. White.....	30¢30¢5
Douglas.....	75¢75¢5
Tanged and Miscellaneous.....	
Tanged Firmers.....	40¢10¢
Tanged Firmers, Butchers'.....	\$4.75¢5.00
Tanged Firmers, Spear & Jackson's	\$5 to 2
Tanged Firmers, Buck Bros.....	30¢
Cold Chisels, ¢ D.....	15¢10¢

Chucks—

Beach Pat.....	each, \$8.00, dia 20¢
Morse's Adjustable.....	each, \$7.00, dia 20¢
Danbury.....	each, \$6.00, dia 30¢30¢5
Syracuse, Balz Pat.....	25¢

Clamps—

Providence Tool Co.'s Wrought Iron.....	25¢
Adjustable, Gray's.....	20¢
Adjustable, Lambert's.....	20¢
Adjustable, Snow's.....	40¢5
Adjustable, Hammers.....	15¢
Adjustable, Stearns.....	20¢10¢
Stearns's Adjustable Cabinet and Cor-	ner.....20¢10¢
Cabinet, Sargent's.....	60¢80¢
Carriage Makers', Sargent's.....	70¢10¢
Eberhard Mfg. Co.....	40¢50¢40¢10¢
Warner's.....	40¢10¢40¢10¢5
Saw Clamps, see Vises	

Clips—

Norway, Axle, ¼ & 5-16.....	55¢55¢5
Second grade Norway Axle, ¼ & 5-16	55¢55¢
Superior Axle Clips.....	60¢60¢50¢55¢5

Norway Spring Bar Clips, 5-16.....	60¢55¢5
Wrought-Iron Felloe Clips.....	¢ 5½¢
Steel Felloe Clips.....	¢ 5½¢
Baker Axle Clips.....	25¢

Cockeyes.....

Cocks, Brass.....	
Hardware list.....	40¢10¢25¢

Coffee Mills—

Box and Side, list revised Jan. 1, 1888,	50¢25¢
American, Enterprise Mfg. Co. 20¢10¢	20¢10¢
The "Swift," Lane Bros.....	20¢10¢

Compasses, Dividers, &c—

Compasses, Calipers, Dividers, 70¢10¢	
Bemis & Call Co.'s Dividers.....	80¢5
Bemis & Call Co.'s Compasses & Cal-	ipers.....50¢5
Bemis & Call Co.'s Wing & Inside or	Outside.....50¢5
Bemis & Call Co.'s Double.....	50¢
Bemis & Call Co.'s (Call's Pat. Inside) 30¢	
Excelsior.....	50¢
J. Stevens & Co.'s Calipers and Dividers	25¢10¢
Starrett's Spring Calipers and Dividers	25¢10¢10¢
Starrett's Lock Calipers and Dividers	25¢10¢
Starrett's Combination Dividers.....	25¢10¢

Coopers' Tools—

Bradley's.....	20¢
Barton's.....	20¢20¢5
L. & I. J. White.....	20¢5
Albertson Mfg. Co.....	25¢
Beatty's.....	40¢40¢5
Sandusky Tool Co.....	30¢30¢5

Corkscrews—

Humason & Beckley Mfg. Co. 40¢40¢10¢	
Clough's Pat.....	35¢35¢45¢
Howe Bros & Hulbert.....	50¢

Cork Knives and Cutters—

Bradley's.....	10¢
Wadsworth's.....	25¢

Cradles—

Grain.....	50¢25¢
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Crow Bars—

Cast Steel.....	¢ 4¢
Iron, Steel Points.....	¢ 3½¢

Curry Combs—

Fitch's.....	50¢10¢50¢10¢10¢
Rubber.....	per doz \$10.00, dia 20¢
Perfect.....	50¢

Curtain Pins—

Silvered Glass.....	net
White Enamel.....	net

Cutlery—

Beaver Falls & Booth's.....	35¢
Wootenholme.....	\$7.75 to 2

Dampers, &c—

Dampers, Buffalo.....	50¢
Buffalo Damper Clips.....	50¢
Crown Damper.....	40¢
Excelsior.....	40¢10¢

Dividers—

See Compasses.

Dog Collars—

Embossed, Gilt, Pope & Steven's list	30¢10¢
Leather, Pope & Steven's list.....	40¢
Brass, Pope & Steven's list.....	40¢

Door Springs—

Torrey's Rod, regular size.....	¢ doz \$1.30
Gray's.....	¢ gr, \$20.00, dia 20¢
Bee Rod.....	¢ gr, \$20.00, dia 20¢
Warner's No. 1, ¢ doz, \$2.50; No. 2,	\$3.50; dia 40¢10¢50¢

Gem (Coll), list April 19, 1888.....	10¢
Star (Coll), list April 19, 1888.....	10¢
Victor (Coll).....	20¢20¢10¢
Champion (Coll).....	60¢10¢60¢10¢10¢
Philadelphia.....	5 in., \$5.00; 8 in., \$7.75;

Cowell's.....No. 1, ¢ doz, \$18.00; No. 2,	\$15.00; dia 50¢
Rubber, complete.....	¢ doz, \$4.50; dia 50¢

Hercules.....	50¢
Shaw Door Check and Spring.....	25¢30¢35¢

Drawing Knives—

Wetherby.....	
P. S. & W.....	75¢5
Mix.....	75¢10¢
New Haven.....	
Merrill.....	60¢10¢10¢
Douglas.....	75¢75¢5
Watrous.....	15¢10¢25¢
L. & I. J. White.....	20¢5
Bradley's.....	35¢
Adjustable Handle.....	25¢35¢4
Wilkinson's Folding.....	25¢25¢5

Drills and Drill Stocks—

Blacksmiths'.....	each \$1.75
Blacksmiths' Self-Feeding.....	each \$7.50,
Breast, P. S. & W.....	dia 20¢
Breast, Wilson's.....	30¢5
Breast, Millers Falls.....	each \$3.00, dia 25¢
Breast, Bartholomew's.....	each \$2.50, dia
	25¢10¢40¢
Ratchet, Merrill's.....	20¢20¢5
Ratchet, Rogers's.....	25¢
Ratchet, Parker's.....	20¢20¢5
Ratchet, Whitney's.....	20¢10¢
Ratchet, Weston's.....	20¢25¢
Ratchet, Moore's Triple Action.....	25¢30¢
Whitney's Hand Drill, Plain.....	\$11.00;
Adjustable.....	dia 20¢10¢
Wilson's Drill Stocks.....	10¢
Automatic Boring Tools.....	each \$1.75
	\$1.85

Twist Drills—

Morse.....	50¢10¢5
Standard.....	50¢10¢5
Syracuse.....	50¢10¢5
Cleveland.....	50¢10¢5
Williams.....	50¢10¢10¢

Drill Bits.—See Augers and Bits.**Drill Chucks.—See Chucks.****Dripping Pans—**

Small sizes.....	¢ 6½¢
Large sizes.....	¢ 6½¢

Egg Beaters.

Dover.....	¢ doz \$1.50
National.....	¢ doz \$4.50, dia 35¢45¢
Family (T. & S. Mfg. Co.).....	¢ gro \$17.00
	\$18.00
Duplex (Standard Co.).....	¢ gro \$15.00
Rival (Standard Co.).....	¢ gro \$12.00
Large Duplex (Standard Co.).....	¢ doz \$4.50
Triumph (T. & S. Mfg. Co.).....	¢ gro \$10.50
	@ \$11.50

Advance, No. 1.....	¢ gro \$10.50
Advance, No. 2.....	¢ gro \$10.00
Bryant's.....	¢ gro \$15.00
4 years' Spiral.....	¢ gro \$5.00
Double (Hamblin & Russell Mfg. Co.)	¢ gro \$16.30
Easy (Hamblin & Russell Mfg. Co.)	¢ gro \$14.00
Tripal (Hamblin & Russell Mfg. Co.)	¢ gro \$16.30
Spiral (Hamblin & Russell Mfg. Co.)	¢ gro \$16.30
Paine, Diehl & Co.'s.....	¢ gro \$24.00

Egg Poachers—

Buffalo Steam Egg Poachers, ¢ doz, No.	1, \$6.00; No. 2, \$9.00.....dia 25¢
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Electric Bell Sets.—

Wellensak's.....	20¢
Bigelow & Dowse.....	20¢

Emery—No. 4 to No. 54 to Flour, CF

48 gr.....	150 gr.....	F F F
Kegs, ¢ 4.....	5.....	2½¢
14 kegs, ¢ 4.....	5½¢	2½¢
14 kegs, ¢ 4.....	5½¢	2½¢
10-b cans, 10.....	5½¢	3 ¢
In case.....	6 ¢	5 ¢
10-b cans, less	than 10.....	10 ¢ 7½¢

Enameled and Tinned Ware—

See Hollow-Ware.

Escutcheon Pins—

Iron, list Nov. 11, 1888.....	50¢10¢50¢10¢5
Brass.....	60¢60¢5

Escutcheons.

Door Lock.....	Same dis as Door Locks.
Brass Thread.....	60¢60¢10¢
Wood.....	25¢

Faucets.—

Fenn's.....	40¢
Bohren's Pat. Rubber Ball.....	25¢
Fenn's Cork Stops.....	35¢45¢
Star.....	60¢
Fray's Pat. petroleum.....	40¢50¢25¢
B. & B. Co.....	
West's Lock, Open and Shut Key.....	50¢
Star, Metal Plug, new list.....	40¢
Lockport, Metal Plug, reduced list.....	60¢
Metallic Key, Leather Lined.....	60¢10¢
Cork Lined.....	70¢50¢70¢10¢
Bunsdick's Red Cedar.....	50¢
Burnside's Red Cedar, bbl lots.....	50¢10¢
John Sommers'.....	
Peerless Best Block Tin Key.....	40¢
IXL, 1st quality, Cork Lined.....	50¢
Diamond Lock.....	40¢
Perfection, Fla. Red Cedar.....	50¢
Goodenough.....	50¢
Boss Metallic Key.....	50¢
Reliable Cork Lined.....	50¢
Western Pattern Cork Lined.....	50¢
Self-Measuring Enterprise, ¢ doz \$50.00	
Self-Measuring, Lane's, ¢ doz \$36.00	
Self-Measuring, Victor, ¢ doz \$36.00	
	dia 25¢10¢

Felloe Plates.....

	¢ 60¢6½¢
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Fifth Wheels.—

Derby and Cincinnati.....	45¢5
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Files—

Domestic.....	
Nicholson (X. F.) Files.....	60¢10¢60¢
Nicholson (X. F.) Files.....	10¢5
Nicholson's Royal Files (Seconds)	25¢
75¢ (extra prices on certain sizes)	
Other makers, best brands.....	60¢10¢60¢10¢10¢
Fair brands.....	60¢10¢10¢10¢
Second quality.....	70¢10¢75¢10¢
Nicholson's Horse Rasps.....	60¢10¢60¢
	10¢5

Heller's Horse Rasps.....

McCaffrey's Horse Rasps.....	50¢10¢
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Imported—

J. & Riley Barr.....	list, April 1, 1888, 15¢
J. & Riley Carr Horse Rasps.....	10¢
Moss & Gamble.....	list, April 1, 1888, 15¢
Butcher.....	Butcher's list, 30¢
Stubs.....	Stubs list, 25¢30¢
Turton's.....	Turton's list, 20¢25¢
Greaves' Horse Rasps.....	American list, 60¢

Fluting Machines—

Knox, 4½-inch Roll.....	\$3.25 each 35¢
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Cross-Cut Saw Handles—
 Atkins' No. 1 Loop, # pair, 30¢; No. 3, 22¢; No. 2 and No. 4 Reversible, 22¢.
 Boynton's Loop Saw Handles, 50¢, dis 60¢.
 Champion, 15¢.

Hangers—
 Barn Door, old patterns, 60¢10¢10¢70¢.
 Barn Door, New England, 60¢10¢10¢70¢.
 Samson Steel Anti-Friction, 50¢.
 Orleans Steel, 50¢.
 Hamilton Wrought Wood Track, 60¢.
 U. S. Wood Track, 60¢.
 Champion, 60¢10¢.
 Rider and Wooster, Medina Mfg. Co.'s list, 70¢.
 Climax Anti-Friction, 70¢.
 Climax Steel Anti-Friction, 50¢.
 Zenith for Wood Track, 50¢.
 Reed's Steel Anti-Friction, 50¢.
 Challenge, Barn Door, 50¢.
 Sterling's Improved (Anti-Friction), 65¢10¢.
 Victor No. 1, \$15.00; No. 2, \$15.50; No. 3, \$18.00, dis 50¢25¢.
 Cheritree, 50¢10¢.
 Kiddle's, 50¢10¢.
 The "Boss", 50¢.
 Best Anti-Friction, 60¢.
 Duplex (Wood Track), 60¢.
 Terry's Pat., # doz pr. 4 in. \$10.00; 5 in. \$12.00, dis 50¢55¢60¢10¢.
 Cronk's Pat., No. 4, \$12.00; No. 5, \$14.40; No. 6, \$18.00, dis 50¢10¢60¢.
 Wood Track Iron Clad, # ft. 10¢, dis 15¢60¢.
 Carrier Steel Anti-Friction, 50¢55¢60¢.
 Architect, # set \$6.00, dis 20¢.
 Eclipse, 20¢10¢.
 Felix, # set \$4.50, dis 20¢.
 Richards', 30¢.
 Lane's Steel Anti-Friction, 30¢.
 Ball Bearing Door Hanger, 30¢10¢25¢10¢.
 Warner's Pat., 20¢20¢10¢.
 Stearns' Anti-Friction, 20¢20¢10¢.
 Stearns' Challenge, 25¢10¢25¢10¢10¢.
 Faultless, 40¢40¢85¢.
 American, # set \$6.00, dis 30¢10¢.
 Rider & Wooster, No. 1, 62¢; dis 40¢.
 Paragon, Nos. 1, 2 and 3, 40¢10¢.
 Paragon, Nos. 5, 5½, 7 and 8, 20¢10¢.
 Crescent, 60¢60¢10¢.
 Nickel, Cast Iron, 50¢.
 Nickel, Malleable Iron and Steel, 40¢.
 Seranton Anti-Friction Single Strap, 30¢.
 Seranton Anti-Friction Double Strap, 40¢.
 Universal Anti-Friction, 40¢.
 Wild West, 4 in. Wheel, \$15.00; 5 in. Wheel, \$21.00, dis 45¢.
 Star, 40¢10¢40¢10¢45¢.
 May, 50¢55¢60¢10¢.
 Barry, \$6.00, dis 40¢10¢.

Harness Snaps—

See Snaps.

Hatchets—

List Jan. 1, 1886.
 Isiah Block, 35¢40¢.
 Hunt's Shingling, Lath and Claw, 40¢55¢.
 Hunt's Broad, 40¢.
 Buffalo Hammer Co., 40¢10¢50¢.
 Hurd's, 40¢10¢50¢.
 Fayette R. Plumb, 40¢10¢50¢.
 Wm. Mann Jr., 50¢.
 Underhill's Tool Co., 40¢55¢60¢10¢.
 Underhill's, Haines and Bright goods, 38¢45¢.
 C. Hammond & Son, 40¢10¢50¢.
 Simmons', 40¢10¢50¢.
 Peck's, 40¢10¢40¢10¢55¢.
 Sargent & Co., 50¢55¢60¢.
 Ten Eyck Edge Tool Co., 40¢10¢40¢10¢55¢.
 Collins, following list, 10¢.
 Shingling, Nos. 1, 2, 3, # doz \$6.50, \$6.00, \$6.50.
 Claw, Nos. 1, 2, 3, # doz \$6.00, \$6.50, \$7.00.
 Lathing, Nos. 1, 2, 3, # doz \$6.50, \$6.00, \$6.50.

Hay and Straw Knives—

Lightning, # Mfrs. price # doz \$18.00, dis 25¢.

Hinges—

Wrought Iron Hinges
 Strap and T, 75¢75¢55¢.
 Screw Hook and 6 to 12 in., # doz 35¢.
 Strap, 22 to 36 in., # doz 35¢.
 Heavy Welded, 6 to 12 in., # doz 35¢.
 Hook, 14 to 30 in., # doz 35¢.
 Screw Hook, 14 in., # doz \$1.50; 16 in., # doz \$2.50; 18 in., # doz \$3.50; 20 in., # doz \$4.50.
 Bolted Blind Hinges, Nos. 32 and 34, 50¢10¢.
 Bolted Blind Hinges, Nos. 232 and 234, 50¢10¢.
 Bolted Plate, 70¢10¢.
 Bolted Raised, 70¢10¢.
 Plate Hinges, 8, 10 & 12 in., # doz 45¢.
 "Providence", over 12 in., # doz 45¢.

Spring Hinges—

Gear's Spring and Blank Butts, 40¢.
 Union Spring Hinge Co.'s list, March, 1886, 20¢.
 Empire and U. S., 20¢.
 Hero and Monarch, 50¢.
 American, Gem, and Star, Japaned, 20¢.
 American, Gem, and Star, Bronzed, net Oxford, Bronze and Brass, 20¢10¢.
 Barker's Double Acting, 20¢10¢.
 Union Mfg. Co., 15¢20¢.
 Exonier's, 30¢.
 Chicago, 30¢.
 Wilson, 10¢.
 Devore's, 40¢.
 Rex, 40¢.

Gate Hinges—

W. E., # doz \$4.40, dis 60¢.
 H. E. Reversible, # doz \$7.00, dis 55¢.
 H. E. Reversible, # doz \$6.50, dis 55¢10¢.
 Clark's, Nos. 1, 2, 3, 60¢10¢55¢.
 N. Y. State, # doz \$6.00, dis 55¢10¢.
 Automatic, # doz \$12.50, dis 50¢.
 Common Sense, # doz pair \$4.50, dis 50¢.
 Seymour's, 40¢10¢.
 Shepard's, 60¢10¢.
 Reed's Latch and Hinges, # doz \$12.00, dis 50¢.

Blind Hinges—
 Parker, 75¢25¢.
 Palmer, 50¢55¢10¢.
 Seymour, 70¢25¢.
 Nicholson, 45¢10¢.
 Huffer, 50¢.
 Clark's, Nos. 1, 3, 5, 40 and 50, 75¢10¢55¢80¢.
 Clark's Mortise Gravity, 50¢.
 Sargent's, Nos. 1, 3, 5, 11, 13, 75¢10¢75¢10¢55¢.
 Sargent's, No. 12, 75¢10¢10¢.
 Reading's Gravity, 75¢10¢75¢10¢55¢.
 Shepard's Noiseless Niagara Buffalo, 75¢10¢75¢10¢55¢.
 Champion, Steamboat, Clark's Old Pattern and Clark's Tip Pattern, 75¢10¢55¢.
 Shepard's O. S., Lull & Porter, 75¢10¢.
 Shepard's Acme, Lull & Porter, 75¢10¢.
 Shepard's Queen City Reversible, 70¢.
 Clark's Lull & Porter, Nos. 0, 1, 1½, 2, 2½, 3, 75¢10¢25¢.
 North's Automatic Blind Fixtures, No. 2, for Wood, \$10.50; No. 3, for Brick, \$13.50, 25¢25¢.

Hees—

Handled—
 Garden, Mortar, &c., 65¢.
 Planter's Cotton, &c., 65¢.
 Warren Hoe, 60¢.
 Magic Hoe, # doz \$4.00.

Eye—

D. & H. Scovill, 20¢.
 Lane's Crescent Planters Pattern, 45¢55¢.
 Lane's Razor Blade, Scovill Pattern, 30¢.
 Maynard, S. & O. Pat., 45¢55¢.
 Sandusky Tool Co., S. & O. Pat., 60¢.
 Hubbard & Co., S. & O. Pat., 60¢.
 Chattanooga Tool Co., S. & O. Pat., 60¢.
 Grub, 60¢60¢10¢.

Hog Rings and Rings—

Hill's Improved Rings, # doz \$4.50.
 Hill's Old Style Rings, # doz \$3.00.
 Hill's Tongs, # doz \$4.50.
 Hill's Rings, # doz bxs \$2.25¢2.40.
 Perfect Rings, # doz bxs \$1.75¢2.00.
 Blair's Hog Rings, # doz \$2.00¢2.65.
 Blair's Hog Rings, # doz \$5¢¢1.00.
 Champion Rings, # doz \$2.00.
 Champion Rings, Double, # doz \$2.25.
 Brown's Rings, # doz \$2.00.
 Brown's Rings, # doz \$1.25¢1.30.

Hoisting Apparatus—

"Moore's" Hand Hoist, with Lock Brake, 20¢.
 "Moore's" Differential Pulley Block, 40¢.
 Energy Mfg. Co.'s, 25¢.

Holders, File and Tool—

Bals Pat., # doz \$4.00; dis 25¢.
 Nicholson File Holders, 20¢.

Hollow-Ware—

Iron—
 Stove Hollow-Ware, Ground, 60¢60¢55¢.
 Stove Hollow-Ware, Underground, 60¢10¢60¢10¢10¢.
Enameled Hollow-Ware—
 Kettles, 65¢10¢.
 Boilers and Saucepans, 40¢55¢.
 Tinned Boilers and Saucepans, 40¢.
 Gray Enameled-Ware—
 Stoves, 50¢50¢55¢.
 Maslin Kettles, 60¢10¢60¢10¢10¢.
 Boilers and Saucepans, 40¢55¢.
 Agate and Granite Ware, 25¢.
 Rustless Hollow-Ware, 50¢50¢55¢.
 Galvanized Tea-Kettles—
 Inch 6 7 8 9
 Each, 55¢ 60¢ 65¢ 75¢.

Silver Plated—

4 mo. or 5 % cash in 30 days.
 Reed & Barton, 40¢55¢.
 Verden Britannia Co., 40¢55¢.
 Simpson, Hall, Miller & Co., 40¢55¢.
 Rogers & Brother, 40¢55¢.
 Hartford Silver Plate Co., 40¢55¢.
 William Rogers Mfg. Co., 40¢55¢.

Hooks—

Cast Iron—
 Bird Cage, Sargent's list, 60¢10¢10¢.
 Bird Cage, Reading, 60¢10¢10¢.
 Clothes Line, Sargent's list, 60¢10¢90¢10¢10¢.
 Clothes Line, Reading list, 60¢10¢90¢10¢10¢.
 Ceiling, Sargent's list, 60¢10¢90¢10¢10¢.
 Harness, Reading list, 55¢10¢55¢10¢10¢.
 Coat and Hat, Sargent's list, 55¢10¢60¢10¢.
 Coat and Hat, Reading, 50¢10¢50¢10¢10¢.

Wrought Iron—

Cotton, # doz \$1.25.
 Cotton Pat. (N. Y. Mallet & Handle Wks.), 30¢.
 Tassel and Picture (T. & S. Mfg. Co.), 50¢.
 Wrought Staples, Hooks, &c., See Wrought Goods.

Wire—

Wire Coat and Hat, Gem, list April, 1886, 45¢.
 Wire Coat and Hat, Miles, list April, 1886, 45¢.
 Indestructible Coat and Hat, 45¢.
 Wire Coat and Hat, Standard, 45¢.
 Belt, 75¢10¢80¢.

Miscellaneous—

Grass No. 2, \$2.00; No. 3, \$2.25; No. 4, \$2.50.
 Bush, 55¢90¢.
 Whitetree Patent, 55¢.
 Hooks and Eyes—Malleable Iron, 70¢70¢10¢.
 Hooks and Eyes—Brass, 60¢10¢10¢.
 Fish Hooks, American, 50¢.
 Bench Hooks, See Bench Stops.

Horse Nails—

Nos. 6 7 8 9 10
 Ausable, 28¢ 26¢ 25¢ 24¢ 23¢.
 Clinton, Fin., 24¢ 22¢ 21¢ 20¢ 19¢.
 Essex, 23¢ 26¢ 25¢ 24¢ 23¢.
 Lyra, 25¢ 23¢ 22¢ 21¢ 20¢.
 Snowden, 25¢ 23¢ 22¢ 21¢ 20¢.
 Putnam, 23¢ 21¢ 20¢ 19¢ 18¢.
 Vulcan, 23¢ 21¢ 20¢ 19¢ 18¢.
 Northwest'n, 25¢ 23¢ 22¢ 21¢ 20¢.
 Globe, 23¢ 21¢ 20¢ 19¢ 18¢.
 A. C., 25¢ 23¢ 22¢ 21¢ 20¢.
 C. B. K., 25¢ 23¢ 22¢ 21¢ 20¢.
 Champlain, 28¢ 26¢ 25¢ 24¢ 23¢.

25¢10¢10¢

New Haven, 28¢ 26¢ 25¢ 24¢ 23¢.
 Saranac, 23¢ 21¢ 20¢ 19¢ 18¢.
 Champion, 25¢ 23¢ 22¢ 21¢ 20¢.
 Capewell, 28¢ 26¢ 25¢ 24¢ 23¢.
 Star, 23¢ 21¢ 20¢ 19¢ 18¢.
 Anchor, 23¢ 21¢ 20¢ 19¢ 18¢.
 Western, 23¢ 21¢ 20¢ 19¢ 18¢.
 Empire Bronzed, 14¢.

Horse Shoes—See Shoes Horse.

Hose, Rubber—

Competition, 75¢10¢75¢10¢55¢.
 Standard, 70¢70¢10¢.
 Extra, 60¢60¢10¢.
 N. Y. B. & P. Co., Para, 30¢10¢.
 N. Y. B. & P. Co., Extra, 50¢.
 N. Y. B. & P. Co., Dundee, 60¢10¢55¢.

Huskers—

Blair's Adjustable, # gr \$8.00.
 Blair's Adjustable Clipper, # gr 7.00.

Indurated Fiber-Ware.

Spittoons, No. 2, # doz \$6.75.
 Basins, Ringed, # doz \$3.70 3.10 2.70.
 Washbasins, Nested, Nos. 0, 1, 2 and 3 (4 pieces), # doz nests, \$16.87.
 Keelers, Nested, Nos. 1, 2, 3 and 4 (4 pieces), # doz nests, \$8.37.
 Butter Bowls, 15, 17 and 19-inch (4 pieces), # doz nests, \$6.75.
 Liquid Measuring, pt., qt., 2 qt. and funnel (4 pieces), # set, \$3.00.
 Dry Measures, 1, 2, 4, 8 and 16 qts. (5 pieces), # set, \$2.25.
 See also Patents.

Jack Screws—See Screws.

Kettles—

Brass, 7 to 17 in., # doz \$4.21.
 Brass larger than 17 in., 20¢ 23¢4¢.
 Enameled and Tea Kettles, See Hollow-Ware.

Keys—

Lock Ass'n list Dec. 30, 1886, 50¢10¢.
 Eagle, Cabinet, &c., 33¢45¢.
 Hotchkiss' Brass Blanks, 40¢.
 Hotchkiss, Copper and Tinned, 40¢.
 Hotchkiss, Brass and Cab., 35¢.
 Ratchet Bed Keys, # doz \$4.00, dis 15¢.
 Wollensak Tinned, 50¢10¢.

Knife Sharpeners—

Pardin's Applewood Handles, # doz \$6.00, dis 40¢.
 Pardin's Rosewood or Cocobolo, # doz \$6.00, dis 40¢.

Knives—

Wilson's Butcher Knives, 25¢30¢.
 Ames' Butcher Knives, 25¢.
 Foster Bros' Butcher, &c., 40¢.
 Nichols' Butcher Knives, 40¢10¢.
 Ames' Shoe Knives, 20¢25¢.
 Ames' Bread Knives, # doz \$1.50, dis 15¢.
 Moran's Shoe and Bread, 15¢.
 Hay and Straw, See Hay Knives.
 Table and Pocket, See Cutlery.
 Corn, Auburn Mfg. Co. Western Pat., \$2.00.
 Corn, Auburn Mfg. Co. Crescent, \$3.50.

Knobs—

Door Mineral, 65¢68¢.
 Door Por. Jap'd, 75¢78¢.
 Door Por. Nickel, \$2.00¢2.25.
 Door Por. Plated, Nickel, \$2.00¢2.25.
 Drawer, Porcelain, 60¢10¢60¢10¢.
 Hensack's Door Knobs, 40¢10¢50¢.
 Yale & Towne Wood, list Dec. 1885, 40¢.
 Furniture, Plain, 75¢ gro inch, dis 10¢.
 Furniture, Wood Screws, 25¢10¢.
 Base, Rubber Tip, 70¢10¢55¢.
 Picture, Judd's, 60¢10¢10¢70¢.
 Picture, Hensack's, 70¢10¢.
 Picture, Sargent's, 35¢55¢.
 Shutter, Porcelain, 55¢10¢.
 Carriage, Jap., # gro 80¢, dis 60¢10¢.

Lades—

Melting, Sargent's, 55¢10¢.
 Melting, Reading, 35¢10¢.
 Melting, Monroe's Pat., # doz \$4.00, dis 40¢.
 Melting, P. S. & W., 35¢10¢40¢.
 Melting, Warner's, 30¢.

Lawn Mowers—

Standard List, 50¢10¢.
 Quaker City, dis 60¢10¢.
 Enterprise, 60¢10¢.

Lanterns—

Tubular—
 Plain with Guards, # doz \$4.00¢4.25.
 Lift Wire, with Guards, # doz \$4.50¢4.75.
 Square Plain, with Guards, # doz \$4.00¢4.25.
 Sq. Lift Wire, with Guards, # doz \$4.25¢4.50.
 Without Guards, 25¢ # doz less.

Miscellaneous.

Police, Small, \$6.00; Medium, \$7.25; Large, \$9.75, dis 50¢25¢.
 Lemon Squeezers—
 Porcelain Lined, No. 1, # doz \$6.00, dis 25¢30¢.
 Wood, No. 2, # doz \$8.00, dis 25¢.
 Wood, Common, # doz \$1.70¢1.75.
 Dunlap's Improved, # doz \$3.75, dis 50¢.
 Sams's, No. 1, \$5.00; No. 2, \$9.12; \$18 # doz, dis 25¢10¢.
 Jennings' "Star", # doz \$2.50.
 The "Boss", # doz \$2.50.
 Dean's, No. 1, # doz \$6.50; 2, \$3.35; 3, \$1.90.

Little Giant.

King, 50¢50¢55¢.
 40¢55¢.

Lines—

Cotton and Linen Line, Draper's, 50¢.
 Draper's Chalk, 50¢.
 Draper's, Mason's Line, 84 ft. No. 1, \$1.25; No. 2, \$1.75; No. 3, \$2.25; No. 4, \$2.75; No. 5, \$3.25, dis 25¢.
 Cotton Chalk, 55¢.
 Samson, Cotton, No. 4, \$2; No. 4½, \$2.50; dis 10¢.
 Silver Lake, Braided, No. 0, \$6.00; No. 1, \$6.50; No. 2, \$7.00; No. 3, \$7.50, dis 25¢.
 Mason's Linen, No. 3½, \$1.50; No. 4, \$2.00; No. 4½, \$2.50.
 Mason's Colored Cotton, 45¢.
 Wire Clothes, No. 18, \$3.00; No. 19, \$3.00; No. 20, \$2.50.

Ventilator Cord, Samson Braided, White or Drab Col., # doz \$7.50, dis 20¢.

Locks, &c.—

Door Locks, Latches, &c.
 List Dec. 30, '86, chgd Feb. 2, '87, dis 50¢10¢60¢55¢.

Mallory, Wheeler & Co., list July, '88, 50¢10¢60¢.

Sargent & Co., list Aug. 1, '88, 55¢25¢.

Reading Hardware Co., list Feb. 2, '88, 100¢60¢10¢.

Livingston & Co., 55¢60¢10¢.

Note.—Lower net prices often made.

Perkins' Burglar Proof, 60¢25¢.

Plate, 35¢45¢.

F. Many's "Extension Cylinder" \$10.50 # doz.

Barnes Mfg. Co., 40¢40¢10¢.

Yale Corrugated Key, 33¢45¢.

Deitz Flat Key, 30¢.

L. & C. Round Key Latches, 30¢10¢.

L. & C. Flat Key Latches, 33¢45¢.

Romer's Night Latches, 15¢.

Yale, new list, 35¢45¢.

"Shepardson" or "U. S.", 40¢10¢.

"Feiler" or "American", 40¢10¢.

Seed's N. Y. Hasp Lock, 25¢.

Cabinet—

Eagle, Gaylord Par., list March, '84, rev. ker and Corbin, Jan. 1, '85, 33¢45¢.

Deitz, Nos. 36 to 39, 40¢.

Deitz, Nos. 51 to 63, 40¢10¢.

Deitz, Nos. 86 to 96, 30¢.

Stoddard Lock Co., 30¢25¢45¢.

"Champion" Night Latches, 40¢.

Barnes Mfg. Co., 40¢40¢10¢.

Eagle and Corbin Trunk, 35¢45¢.

Yale, 35¢45¢.

Romer's, 35¢45¢.

Padlocks—

List Dec. 23, '84, 75¢75¢10¢.

Yale Lock Mfg. Co.'s, 30¢45¢.

Hotchkiss, 40¢.

Eureka, Eagle Lock Co., 40¢25¢.

Romer's, Nos. 0 to 91, 30¢.

Romer's Scandinavian, &c., Nos. 100 to 506, 15¢.

A. E. Deitz, 40¢.

"Champion" Padlocks, 40¢.

Hotchkiss, 40¢.

"Star", 30¢.

"Horsehoe", # doz \$8, dis 40¢10¢.

Barnes Mfg. Co., 40¢40¢10¢.

Noel's, 30¢.

Brown's Pat., 35¢.

Scandinavian, 90¢90¢10¢.

Fram's Pat. Scandinavian low list, 50¢.

Ames Sword Co. up to No. 150, 40¢.

Molasses Gates—	
Stebbin's Pat.	70¢@70¢75¢
Stebbin's Genuine	50¢@10¢
Stebbin's Tinned Ends	40¢@10¢
Chase's Hard Metal	50¢@10¢
Bush's	30¢
Lincoln's Pattern	70¢@70¢10¢
Weed's	50¢@10¢
Boss, 7 dos:	
No. 1, 87; No. 2, 88; No. 3, 89; No. 4, 90	60¢@10¢10¢
Money Drawers—	
Muzzles—	
Safety	7 dos, \$3.00 dis 25¢
Nails, see Trade Report.	
Wire Nails & Brads, list July 14, '87	
Wire Nails, Standard Penny	7¢@10¢
Wire Nails, Standard Penny	\$2.50@3.50
Nail Puller—	
Curtis Hammer	7 dos \$9, net
Giant, No. 1	7 dos, \$30.00, 10¢
Pelican	7 dos, \$9.00, dis 25¢
Boss	7 dos, \$30.00, dis 30¢
Lightning	7 dos \$21.00
Nail Sets—	
Square	7 gr, \$4.00@4.25
Round	7 gr, \$3.25
Canon's Diamond Point	7 gr, \$12, 20¢
Nut Crackers—	
Table (H. & B. Mfg. Co.)	40¢
Blake's Pattern	7 dos \$3.00, dis 10¢
Turner & Seymour Mfg. Co.	50¢
Nuts—	
Nuts, off list Jan. 1, 1888: Square. Hex. Hot Pressed	5¢@ 5.5¢
Cold Forged	5.4¢ 5.5¢
In lots less than 100 lb. 7 lb. add 1¢; 1-lb boxes, add 1¢ to list.	
Oakum—	
Government	7 lb 7¢ @ 8¢
U. S. Navy	7 lb 6¢ @ 7¢
Navy	7 lb 5¢ @ 6¢
Oilers—	
Zinc and Tin	65¢@65¢10¢
Brass and Copper	50¢@10¢50¢10¢
Malleable, Hammer's Improved, No. 1, 88.60; No. 2, 84.00; No. 3, 84.40 7 dos, dis 10¢@10¢10¢	
Malleable, Hammer's, Old Pattern, same list	40¢
Prior's Pat. or "Paragon" Zinc	60¢@10¢10¢
Prior's Pat. or "Paragon" Brass	50¢
Olmedstead's Tin and Zinc	80¢
Olmedstead's Brass and Copper	50¢
Broughton's Zinc	60¢
Broughton's Brass	50¢
Packing, Steam—	
Rubber—	
Standard	60¢@10¢60¢10¢10¢
Extra	50¢@10¢60¢
N. Y. B. & P. Co., Standard	50¢@10¢60¢
N. Y. B. & P. Co., Empire	70¢
N. Y. B. & P. Co., Salamander	70¢
Jenkins' Standard	70¢ 80¢, dis 30¢
Jenkins' Standard	70¢ 80¢, dis 30¢
Miscellaneous—	
American Packing	10¢@11¢ 7 lb
Russia Packing	14¢ 7 lb
Italian Packing	14¢ 7 lb
Cotton Packing	15¢@17¢ 7 lb
Jute	7¢@8¢ 7 lb
Padlocks—	
See Locks.	
Pails—	
Galvanized Iron—	
Quarts	10 12 14
Hill's Light Weight, 7 dos, \$2.75 8.00 8.25	
Hill's Heavy Weight, 7 dos, \$3.00 3.25 3.75	
Whiting's	2.75 3.00 3.25
Sidney Shephard & Co.	2.80 3.00 3.40
Iron Clad	2.75 3.00 3.25
Fire Buckets	2.75 3.25 3.50
Buckets, see Well Buckets.	
Indurated Fibre Ware—	
Star Pails, 13 qt	7 dos \$4.50
Fire, Stable and Milk, 14 qt	7 dos \$5.50
Pencils—	
Faber's Carpenters'	high list 50¢
Faber's Round Gilt	7 gr \$5.25 net
Dixon's Lead	7 gr \$4.50 net
Dixon's Lumber	7 gr \$6.75 net
Dixon's Carpenters'	40¢@10¢
Picks—	
Railroad or Adse Eye, 5 to 6, \$12.00; 6 to 7, \$13.00	dis 60¢@60¢10¢
Picture Nails—	
Brass Head, Sargent's list	50¢@10¢10¢
Brass Head, Combination list	50¢@10¢
Porcelain Head, Sargent's list	50¢@10¢10¢
Porcelain Head, Combination list	40¢@10¢
Niles' Patent	40¢
Pinking Irons—	
7 dos 65¢ net	
Pipe, Wrought Iron—	
List March 23, 1887.	
14 and under, Plain	55¢
14 and under, Galvanized	47¢@55¢
14 and over, Plain	65¢
14 and over, Galvanized	55¢
Boller Tubes, Iron	60¢
Planes and Plane Irons—	
Wood Planes—	
Molding	50¢@50¢10¢
Bench, First Quality	60¢@25¢
Bench, Second Quality	60¢@10¢60¢10¢10¢
Bailey's (Stanley R. & L. Co.)	40¢@10¢
Iron Planes—	
Bailey's (Stanley R. & L. Co.)	40¢@10¢
Miscellaneous Planes (Stanley R. & L. Co.)	20¢@10¢
Victor Planes (Stanley R. & L. Co.)	20¢@10¢
Steele's Iron Planes	35¢@35¢5¢
Meriden Mal Iron Co.'s	30¢@10¢30¢10¢10¢
Davis's Iron Planes	30¢@10¢30¢10¢10¢
Birmingham Plane Co.	50¢@50¢5¢
Gage Tool Co.'s Self-Setting	20¢@10¢
Chaplin's Iron Planes	40¢@40¢5¢
Sargent's	30¢@10¢30¢10¢10¢

Plane Irons—	
Plane Irons	20¢@10¢
Plane Irons, Butcher's	\$5.00@5.25 to 2
Plane Irons, Buck Bros	30¢
Plane Irons, Auburn Tool Co., "This tie"	40¢
Sandusky Tool Co.:—	
Single and Cut	30¢
Double	40¢
L. & I. J. White	25¢
Pliers and Nippers—	
Button's Patent	30¢@10¢40¢
Hall's No. 2, 5 in., \$13.50; No. 4, 7 in., \$21.00 7 dos	dis 20¢@10¢35¢
Humason & Beckley Mfg. Co.	50¢@50¢10¢
Gas Pliers	60¢
Gas Pliers, Custer's Nickel Plated	60¢@5¢
Eureka Pliers and Nippers	40¢
Russell's Parallel	25¢
P. S. & W. Cast Steel	50¢
P. S. & W. Tinner's Cutting Nippers	add 6¢ dis 10¢
Carew's Pat. Wire Cutters	20¢
Morrill's Parallel, 7 dos, \$12.00	30¢@5¢
Cronk's 8 in., \$15.00; 10 in., \$21.00	40¢@40¢5¢
Plumbs and Levels—	
Regular List	70¢@10¢70¢10¢10¢
Disston's	55¢@10¢
Pocket Levels	70¢@10¢70¢10¢10¢
Davis Iron Levels	30¢
Davis' Inclinoimeters	10¢@10¢
Poppers, Corn—	
Round or Square, 1 qt.	7 gr \$12.00@15.00
Round or Square, 2 qt.	7 gr \$25.00@26.00
Post Hole and Tree Augers and Diggers—	
Samson Post Hole Digger, 7 dos \$36.00	dis 25¢10¢
Fletcher Post Hole Augers, 7 dos \$36.00	dis 25¢10¢
Eureka Diggers	7 dos \$16.00@17.00
Lead's	7 dos \$8.00@9.00
Vaughan's Post Hole Auger, 7 dos \$13.00@14.00	dis 20¢
Kohler's Little Giant	7 dos \$18.00
Kohler's Hercules	7 dos \$15.00
Kohler's New Champion	7 dos \$18.00
Schneider	7 dos \$18.00
Ryan's Post Hole Diggers	7 dos \$24.00
Cronk's Post Bars, 7 dos \$60.00	dis 50¢@50¢10¢
Gibb's Post Hole Digger, 7 dos \$30.00	dis 40¢@40¢10¢
Potato Parers—	
White Mountain	7 dos \$5.00@5.50
Antrim Combination	7 dos \$8.00
Hoosier	7 dos \$13.50
Pruning Hooks and Shears—	
Disston's Combined Pruning Hook and Saw	7 dos \$18.00, dis 20¢@10¢
Disston's Pruning Hook, 7 dos \$12.00	dis 20¢@10¢
E. S. Lee & Co.'s Pruning Tools	40¢
Pruning Shears, Henry's Pat., 7 dos \$7.50	net
Henry's Pruning Shears, 7 dos \$25.00	4.50 net
Wheeler, Co.'s Combination	7 dos \$12.00, dis 20¢
Dunlap's Saw and Chisel	7 dos \$8.50
J. Mallinson & Co., No. 1, \$5.25; No. 2, 7.25	dis 30¢
Pulleys—	
Hot House, Awning, &c.	60¢@10¢
Japanned Screw	60¢@10¢
Brass Screw	60¢@10¢
Japanned Side	60¢@10¢
Japanned Clothes Line	60¢@10¢
Empire Sash Pulley	50¢@60¢
Moore's Sash, Anti-Friction	60¢
Hay Fork, Solid Eye, 5 in. Solid, \$4.50	dis 50¢@10¢50¢
Hay Fork, "Anti-Friction," 5 in. Solid, \$6.70	dis 50¢
Hay Fork, "F" Common and Pat. Bushed	20¢
Hay Fork, Tarbox Pat. Iron	20¢
Hay Fork, Reed's Self-Lubricating	60¢
Shade Rake	45¢
Tackle Blocks	See Blocks
Pumps—	
Cistern, Best Makers	60¢@10¢60¢
Pitcher Spout, Best Makers	60¢@10¢60¢
Pitcher Spout, Cheaper Goods	70¢@10¢60¢
Punches—	
Saddlers' or Drive, good quality, 7 dos 60¢@65¢	
Bemis & Call Co.'s Cast Steel Drive	60¢@5¢
Bemis & Call Co.'s Springfield Socket	50¢@5¢
Spring, good quality	7 dos \$2.50@2.80
Spring, Leach's Pat.	15¢
Bemis & Call Co.'s Spring and Check	40¢
Solid Tinner's	7 dos \$1.44, dis 55¢
Tinner's Hollow Punches	20¢@25¢
Rice Hand Punches	15¢
Avery's Revolving	30¢@10¢
Avery's Saw-Set and Punch. See Saw Sets.	
Rail—	
Sliding Door, Wrt Brass, 7 lb 35¢, dis 15¢	
Sliding Door, Bronzed Wrt Iron, 7 lb 7¢	
Sliding Door, Iron, Painted	7 foot 4¢
Barn Door, Light In. 4	dis 20¢@10¢5¢
Per 100 feet	\$2.50 3.00 4.40, dis 10¢
B. D. for N. E. Hangers	Small. Med. Large.
Per 100 feet	\$2.15 2.70 3.25, net
Terry's Wrought Iron, 7 foot	4¢@5¢
Victor Track Rail, 7 foot	dis 50¢@25¢
Carrier Steel Rail, 7 foot	4¢@5¢
Rakes—	
Cast Steel, Association goods	60¢
Cast Steel, outside goods	60¢@10¢70¢
Malleable	70¢@70¢5¢
Gibbs Lawn Rake	\$12.00, dis 50¢
Canton Lawn Rake	\$9.00, dis 50¢
Ft. Madison Prize Bow Brace and Peerless	65¢
Fort Madison Steel Tooth Lawn Rake	\$6.00, dis 25¢
Razors—	
J. R. Torrey Razor Co.	20¢
Wostenholme and Butcher, \$10.00 to 2	dis 10¢

Razor Straps—	
Genuine Emerson	60¢@60¢5¢
Imitation	7 dos \$2.00, dis 20¢@10¢5¢
Torrey's	30¢
Badger's Belt and Com	7 dos \$2.00
Lamont Combination	7 dos \$4.00
Rivets and Burrs—	
Copper	50¢@50¢10¢
Iron, list Nov. 17, '87	50¢
Rivet Sets—	
dis 50¢@20¢50¢10¢	
Rods—	
Stair, Brass	25¢@25¢
Stair, Black Walnut	7 dos 40¢
Rollers—	
Barn Door, Sargent's list	60¢@10¢10¢
Acme (Anti-Friction)	55¢
Union Barn Door Roller	70¢
Rope—	
Manufacturers' prices for large lots:	
Manila, 1/4 in. and larger	15¢@15¢
Manila, 1/4 in.	15¢@15¢
Manila, 1/4 and 5-16 in.	15¢@15¢
Manila Tarred Rope	15¢@15¢
Manila Hay Rope	15¢@15¢
Sisal, 1/4 inch and larger	13¢@13¢
Sisal, 1/4 and 5-16 in.	13¢@13¢
Sisal, 1/4 and 5-16 in.	13¢@13¢
Sisal, Hay Rope	13¢@13¢
Sisal, Tarred Rope	13¢@13¢
Sisal, Medium Lathe Yarn	12¢@12¢
Cotton Rope	15¢@15¢, net
Jute Rope	7¢@7¢
Rules—	
Boxwood	80¢@10¢80¢10¢10¢
Ivory	50¢@50¢10¢
Starrett's Rules and Straight Edges	25¢@10¢
Saw Irons—	
From 4 to 10, at factory	7 100 lb
Self-Heating	\$2.40@2.55
Self-Heating, Tailors	7 dos \$18.00 net
Self-Heating, Shield and Toilet	25¢
Self-Heating, Tailors	40¢@40¢5¢
Enterprise Star Irons	7 dos
Combined Fluter and Saw Iron, 7 dos, \$15.00	dis 15¢
Fox Reversible, Self-Fluter	7 dos \$24.00 net
Chinese Laundry (N. E. Butt Co.) 8 1/2	dis 15¢
New England	5¢, dis 15¢
Mahony's Troy Pol. Irons	25¢
Sensible	30¢@20¢5¢
National Self-Heating	dis 30¢
Sand and Emery Paper and Cloth—	
List April 19, 1888	40¢@40¢10¢
Sibley's Emery and Crocus Cloth	30¢
Sash Cord—	
Common	7 lb 10¢@11¢
Patent, good quality	7 lb 13¢@13¢5¢
White Cotton Braided, fair quality	7 lb 25¢@25¢
Common Russia Sash	7 lb 13¢@13¢
Patent	7 lb 15¢
Cable Laid Italian Sash	7 lb 22¢@22¢
India Cable Laid	7 lb 13¢
Silver Laks—	
A Quality, White, 50¢	dis 10¢@10¢5¢
A Quality, Drab, 55¢	dis 10¢@10¢5¢
B Quality, White, 50¢	dis 10¢@10¢5¢
B Quality, Drab, 55¢	dis 10¢@10¢5¢
O Quality, White (only)	25¢@25¢5¢
Sylvan Spring, Extra Braided, White, 84¢	
Sylvan Spring, Extra Braided, Drab, 84¢	
Semper Idem, Braided, White	80¢
Egyptian, India Hemp, Braided	80¢
Samsen—	
Braided, White Cotton, 50¢	30¢@30¢5¢
Braided, Drab Cotton, 55¢	30¢@30¢5¢
Braided, Italian Hemp, 55¢	30¢@30¢5¢
Braided, Linen, 80¢	dis 30¢@30¢5¢
Sash Locks—	
Clark's, No. 1, \$10.00; No. 2, \$8.00 7 gr, dis 35¢@35¢	
Ferguson's	dis 35¢@35¢
Morris and Triumph, list Aug. 16, 1888	60¢@25¢
Victor	60¢@10¢25¢
Walker's	10¢
Attwell Mfg. Co.	25¢@35¢
Bedding, White, 50¢	60¢@10¢60¢10¢10¢
Hammond's Window Springs	40¢
Common Sense, Jap'd, Cop'd and Br'zed	7 gr \$4.00
Common Sense, Nickel Plated	7 gr \$10.00
Universal	80¢
Kempshall's Gravity	60¢
Kempshall's Model	60¢@60¢10¢
Corbin's Daisy, list Feb. 15, 1888	70¢
Payson's Perfect	60¢@60¢10¢
Huginin's Sash Balances	25¢@25¢25¢
Huginin's New Sash Locks	25¢@25¢25¢
Stoddard's "Practical"	10¢
Ives' Patent	60¢@60¢10¢
Liesche's, Nos. 100 and 110, 7 gr 8¢	
106, \$10.00	dis 20¢@10¢
Davis, Bronze, Barnes Mfg. Co.	50¢
Champion Safety, list March 1, 1888	55¢@55¢5¢
Security	70¢
Sash Weights—	
Solid Eyes	7 ton \$22.00
Sausage Stuffers or Fillers—	
Milas' "Challenge," 7 dos \$20.00	dis 50¢@50¢5¢
Perry	7 dos, No. 1, \$15.00; No. 0, \$21.00
dis 50¢@50¢5¢	
Draw Cut No. 4, each \$30.00	dis 20¢
Enterprise Mfg. Co.	20¢@10¢30¢
Silver's	40¢@10¢
Saws—	
Disston's Cir- cular	45¢@45¢5¢
Disston's Cross	45¢@45¢5¢
Disston's Hand	25¢@25¢5¢
Atkins' Circular Shingle and Heading	50¢@10¢

Atkin's Silver Steel Diamond X Cuts	7 foot 70¢
Atkins' Special Steel Dexter X Cuts	7 foot 50¢
Atkins' Special Steel Diamond X Cuts	7 foot 30¢
Atkins' Champion and Electric Tooth X Cuts	7 foot 27¢@25¢
Atkins' Hollow Back X Cuts	7 foot 18¢
Atkins' Mulay, Mill and Drag	40¢
W. M. & C. Hand	30¢@50¢30¢10¢
W. M. & C. Champion X Cuts, Regular	7 foot 24¢@20¢
W. M. & C. X Cuts, Thin Back	7 foot 24¢@20¢
Peace Circular and Mill	7 foot 27¢@25¢
Peace Hand Panel and Rip	20¢10¢20¢10¢10¢
Peace Cross Cuts, Standard	7 foot 25¢
Peace Cross Cuts, Thin Back	7 foot 27¢@25¢
Richardson's Circular and Mill	45¢45¢10¢
Richardson's X Cuts, No. 1, 30¢; No. 2, 27¢; No. 3, 24¢	
Hack Saws—	
Griffin's, complete	40¢10¢50¢
Crimson's Hack Saw, Blades	20¢10¢@50¢
Star Hack Saws and Blades	40¢
Diamond Hack Saws and Blades	25¢
Eureka and Crescent	25¢
Saw Frames—	
White Vermont	7 gro \$9.00, dis \$10.00
Red, Polished and Varinshed	7 dos \$1.50, dis 25¢
Saw Sets—	
Stillman's Genuine	7 dos \$5.00@7.75, dis 40¢45¢
Stillman's Imits	7 dos \$3.25@5.25, dis 40¢45¢@10¢
Common Lever	7 dos \$5.00, dis 40¢45¢
Morrill's No. 1, \$15.00; Nos. 3&4, \$24.00	
Leach's...No. 0, \$8.00; No. 1, \$15.00, dis 15¢30¢	
Nash's	30¢10¢20¢10¢10¢
Hammer, Hotchkiss	\$5.50, dis 10¢
Hammer, Bemis & Call Co's new Pat. Hammer	30¢45¢
Bemis & Call Co's Lever and Spring Hammer	30¢45¢
Bemis & Call Co's Plate	10¢
Bemis & Call Co's Cross Cut	12¢45¢
Alken's Genuine	\$13.00, dis 50¢10¢
Alken's Imitation	\$7.00, dis 55¢45¢
Alken's Lever	40¢
Diston's Star, \$9, No. 10, \$5.50; dis 10¢20¢10¢10¢	
Atkin's Lever, 7 dos No. 1, \$6.00; No. 2, \$3.00	
Atkin's Criterion	7 dos \$7.50
Crosland (Keller), No. 1, \$15.00; No. 2, \$24.00	
Avery's Saw Set and Punch	40¢
Am. Tool Co.'s Superior, 7 dos \$15, dis 10¢	
Saw Tools—	
Atkin's Perfection, \$15.00; Excelsior, \$6.00	
Scales—	
Hatch, Counter, No. 171, good quality	7 dos \$21.00
Hatch, Tea, No. 181	7 dos \$6.75@7.00
Union Platform, Plain	\$2.00@2.30
Union Platform, Striped	\$2.20@2.30
Chatillon's Grocers' Trip Scales	80¢
Clark's Trip Scales	25¢
Chatillon's Favorite	30¢
Family, Turnbills	30¢@30¢10¢
Riehle Bros' Platform	5¢
Scale Beams—	
Scale Beams, List Jan. 12, '83	50¢10¢
Chatillon's No. 1	50¢10¢45¢
Chatillon's No. 2	40¢
Scraper—	50¢
Adjustable Box Scraper (S. R. & L. Co.) \$6.50	
Box, 1 Handle	7 dos \$4.00, dis 10¢
Box, 2 Handle	7 dos \$6.00, dis 10¢
Defiance Box and Ship	30¢10¢
Foot	50¢10¢20¢
Ship, Providence	7 dos \$3.50, net
Ship, Providence Tool Co.	10¢
Screen Window and Door Frames—	
Porter's Pat. Window and Door Frame	35¢10¢
Screen Corner Irons, Warner's	35¢10¢
Stearns' Frames and Corners	25¢@25¢10¢
Screw Drivers—	
Douglas Mfg. Co.	20¢10¢10¢
Diston's	45¢10¢
Diston's Pat. Excelsior	45¢10¢
Buck Bros	30¢
Stanley R. & L. Co.'s Varinshed Handies	55¢10¢
Stanley R. & L. Co.'s Black Handies	60¢10¢
Sargent & Co.'s No. 1 Forged Blade	60¢10¢10¢
Sargent & Co.'s Nos. 20, 30 and 60	60¢10¢
Knapp & Cowies' No. 1	60¢@50¢70¢
Knapp & Cowies' No. 1 Extra	60¢@50¢10¢
Knapp & Cowies' Nos. 00 & 4	50¢45¢
Stearns'	50¢10¢45¢
Gay & Parsons	35¢
Champion	25¢10¢
Clark's Pat.	30¢@35¢
Crawford's Adjustable	80¢
Ellrich's Socket and Ratchet	25¢@25¢10¢
Allard's Spiral, new list	25¢
Koll's Common Sense	7 dos \$6.00, dis 25¢10¢
Syracuse Screw-Driver Bits	30¢30¢25¢
Screw Driver Bits	7 dos 10¢45¢
Screw-Driver Bits, Parr's	7 gro \$6.25
Fray's Hol. Hdle. Sets.No. 3, \$12.00, dis 25¢@25¢10¢	
P. D. & Co.'s all Steel	50¢
Screws—	
Wood Screws—List, Brass, Jan. 27; Iron, July 1, 1887.	
Flat Head Iron	70¢
Round Head Iron	85¢
Flat Head Brass	85¢
Round Head Brass	85¢
Flat Head Bronze	85¢
Extra 10% often given by jobbers	

Machines—	
Flat Head, Iron.....	55¢
Round Head, Iron.....	60¢
Bench and Hand—	
Bench, Iron.....	55¢10¢50¢10¢10¢
Bench, Wood, Bench.....	50¢22¢25
Bench, Wood, Hickory.....	20¢10¢
Hand, Wood.....	25¢10¢25¢10¢5¢
Lag, Blunt Point.....	75¢75¢10¢
Coach and Lag, Gimlet Point.....	75¢
Bed.....	25¢5¢
Hand Rail, Sargent's.....	60¢10¢
Hand Rail, H. & E. Mfg. Co.....	70¢10¢75¢
Hand Rail, Am. Screw Co.....	75¢
Jack Screws, Millers Falls List.....	50¢50¢5¢
Jack Screws, P. S. & W.....	35¢
Jack Screws, Sargent.....	60¢10¢50¢10¢5¢
Jack Screws, Stearns.....	40¢40¢10¢
Scroll Saws—	
Letter, complete, \$10.00.....	25¢
Rogers, complete, \$4.00.....	25¢
Barnes' Builders' and Cabinet Makers'.....	60¢10¢
\$15.....	25¢
Barnes' Scroll Saw Blades.....	35¢
Scythe Snaths—	
Shears.....	50¢25¢
Americas (Cast) Iron.....	
Pruning.....	75¢10¢75¢10¢5¢
Barnard's Lamp Trimmers.....	50¢35¢
Timers.....	20¢25¢
Beymour's, List, Dec. 1881.....	60¢10¢10¢
Heinrich's, List, Dec. 1881.....	60¢10¢10¢
Heinrich's Tailor's Shears.....	35¢
First quality C. S. Trimmers.....	80¢80¢10¢
Second quality C. S. Trimmers.....	80¢10¢80¢10¢10¢
Acme Cast Shears.....	10¢10¢
Diamond Cast Shears.....	10¢
Clipper.....	10¢10¢
Victor Cast Shears.....	75¢10¢75¢10¢5¢
Howe Bros. & Hulbert, Solid Forged.....	40¢
Chicago Drop Forge & F. Co., Solid.....	70¢
Steel Forged.....	70¢
Clausen Shear Co., Japanned.....	70¢
Clausen Shear Co., Nickeled, same list.....	60¢
Sheaves—	
Sliding Door—	
N. W. & Co., List July, 1888.....	50¢10¢90¢15¢
R. & E., List Dec. 18, 1885.....	55¢20¢
Corbin's List.....	60¢10¢25¢
Patent Roller.....	60¢10¢25¢
Patent Roller, Hatfield's.....	75¢
Russell's Anti-Friction, List Dec. 18, 1885.....	60¢25¢
Moore's Anti-Friction.....	60¢
Sliding Shutter—	
R. & E. List Dec. 18, 1885.....	60¢10¢25¢
Sargent's List.....	60¢10¢
Reading List.....	60¢10¢10¢
Ship Tools—	
L. & I. J. White.....	20¢25¢
Albertson Mfg. Co.....	25¢
Sheep, Horse, Mule, &c.—	
Horse—	
Burden's, Perkins', Phoenix, at factory.....	\$4.00
Mule—	
Add \$1 per keg to above prices.	
Ox, Wrought—	
Ton lots.....	50¢ 5¢
1000 lb lots.....	50¢ 5¢
500 lb lots.....	50¢ 10¢
Shot—	
<i>(Eastern prices 2¢ off, cash, 5 days.)</i>	
Drop, 5 bag, 25 lb.....	\$1.20
Drop, 5 bag, 25 lb.....	\$1.20
Back and Chilled, 5 25 lb bag.....	1.35
Back and Chilled, 5 25 lb bag.....	1.45
Shovels and Spades—	
Ames' Shovels, Spades, &c., List Nov. 1, 1885.....	20¢
North-Jobbers frequently give 5¢/75¢ extra on above.	
Griffith's Black Iron.....	50¢10¢
Griffith's C. S.....	60¢50¢10¢
Griffith's Solid.....	60¢50¢10¢
Old Colony (Sanford Fork & Tool Co.).....	20¢20¢75¢
St. Louis Shovel Co.....	20¢20¢75¢
Hussey, Blinn & Co.....	15¢25¢
Hubbard & Co.....	20¢20¢75¢
Lehigh Mfg. Co.....	50¢10¢
Payne Petebone & Son, List January, 1886.....	30¢
Remington's (Lowman's Patent).....	30¢10¢40¢
Rowland's, Black Iron.....	50¢10¢
Rowland's Steel.....	60¢5¢60¢10¢
Shovels and Tongues—	
Iron Head.....	60¢10¢60¢10¢5¢
Brass Head.....	60¢10¢10¢
Skeins, Thimble—	
Western list.....	75¢5¢75¢10¢
Columbus Wrt. Steel, List Nov. 1, 1887.....	20¢
Coldbrookdale Iron Co.....	50¢10¢
Utica P. S. T. Skeins.....	60¢
Utica Turned and Pitted.....	35¢
Stoves—	
Buffalo Metallic, S. S. & Co.....	50¢25¢10¢
Barber Flour Sifters.....	50¢20¢
Smith's Adjustable Sifters.....	50¢22¢
Smith's Adjustable Milk Strainer.....	50¢
Smith's Adjustable F. & C. Strainer.....	50¢1.75
Stoves, Wooden Rim—	
Wye 12, Nested, 5 doz.....	70¢ 90¢
Wye 20, Nested, 5 doz.....	70¢ 1.00
Wye 24, Nested, 5 doz.....	1.10 1.10
Stoves—	
School, by case.....	50¢10¢
Snaps, Harness, &c.—	
Anchor (T. & S. Mfg. Co.).....	65¢
Fitch's (Bristol).....	50¢10¢
Hitchhikes.....	10¢
Andrews.....	50¢
Sargent's Patent Guarded.....	70¢10¢10¢
Gerritt's, Patent Iis.....	40¢10¢
Cover.....	50¢25¢
Cover, New R. E.....	60¢25¢
Covered Spring.....	60¢10¢10¢
Soldering Irons—	
Covert's Adjustable, List Jan. 1, 1888.....	35¢25¢
Spoke Shaves—	
Iron.....	45¢
Wood.....	50¢
Bayley's (Stanley R. & L. Co.).....	40¢10¢
Stearns.....	20¢10¢30¢
Spoke Trimmers—	
Bonney's.....	50¢ doz \$10.00, dis 50¢
Stearns.....	50¢10¢
Ives', No. 1, \$15.00; No. 2, \$12.00.....	55¢10¢
Douglas.....	50¢ doz \$9.00, dis 20¢
Spoons and Forks—	
Tinned Iron—	
Basting, Cen. Stamp. Co.'s list.....	70¢10¢
Solid Table and Tea, Cen. Stamp. Co.'s list.....	70¢10¢
Buffalo S. S. & Co.....	35¢25¢
Silver-Plated—(4 mos. or 5¢ cash 30 days.)	
Meriden Brit. Co., Rogers.....	50¢
Rogers & Bros.....	50¢
Rogers & Bros.....	50¢
Read & Barton.....	50¢
Wm. Rogers Mfg. Co.....	50¢10¢60¢
Simpson, Hall, Miller & Co.....	50¢10¢
Holmes & Edwards Silver Co.....	50¢10¢
H. & E. Silver Co., Mexican Silver.....	50¢10¢25¢
H. & E. Silver Co., Durham Silver.....	50¢10¢
German Silver.....	50¢60¢5¢
German Silver, Hall & Eiton.....	50¢25¢ cash
Nickel Silver.....	60¢25¢50¢10¢5¢ cash
Britannia.....	60¢
Boardman's Flat Ware.....	50¢10¢
Boardman's Nickel Silver.....	50¢
Boardman's Britannia Spoons, cases lots.....	60¢
Springs—	
Elliptic, Concord, Platform and Half Scroll.....	60¢60¢5¢
Cliff's Bolster Springs.....	25¢
Squares—	
Steel and Iron.....	75¢10¢80¢
Nickel-Plated.....	60¢10¢10¢70¢
Try Square and T Bevels.....	60¢10¢10¢70¢
Dixton's Try Square and T Bevels.....	45¢10¢
Winterbottom's Try and Miter.....	30¢10¢
Starrett's Micrometer Caliper Squares.....	25¢
Avery's Flush Bevel Squares.....	80¢5¢
Staples—	
Fence Staples, Galvanized.....	Same price
Fence Staples, Plain.....	See Trl. Rep.
Steelyards—	
40¢10¢50¢	
Stocks and Dies—	
Blacksmith's Waterford Goods.....	30¢
Blacksmith's Butterfield's Goods.....	50¢30¢10¢
Blacksmith's Butterfield's Goods.....	50¢30¢10¢
Lightning Screw Plate.....	25¢30¢
Reece's New Screw Plates.....	35¢25¢40¢
Stone—	
Hindustan No. 1, 3¢; Axe, 3¢; Slips No. 1, 4¢	
Sand Stone.....	50¢ 2¢
Washita Stone, Extra.....	50¢ 10¢25¢
Washita Stone, No. 1.....	50¢ 14¢15¢
Washita Stone, No. 2.....	50¢ 10¢11¢
Washita Stone, No. 1, Extra.....	50¢ 30¢35¢
Washita Stone, No. 1.....	50¢ 24¢25¢
Arkansas Stone, No. 1, 4 to 6 in.....	50¢ 15¢
Arkansas Stone, No. 1, 6 to 9 in.....	50¢ 15¢
Turkey Oil Stone, 4 to 8 in.....	50¢ 40¢
Turkey Slips.....	50¢ 1.00-1.50
Lake Superior Slips, Chase.....	50¢ 1.00
Lake Superior Slips, Chase.....	50¢ 31¢32¢
Seneca Stone, Red Paper Brand.....	50¢ 1.00
Seneca Stone, High Rounds.....	50¢ 20¢
Seneca Stone, Small White.....	50¢ 24¢40¢
Stove Polish—	
Joseph Dixon.....	50¢ gro \$6.00, dis 10¢
Gem.....	50¢ gro \$4.50, dis 10¢
Gold Metal.....	50¢ gro \$6.00, dis 10¢
"Mirror".....	50¢ gro \$6.00, dis 10¢
Lustro.....	50¢ gro \$4.75, net
Ruby.....	50¢ gro \$3.75, net
Rising Sun, 5 gro lots.....	50¢ gro \$5.50
Dixon's Plumbago.....	50¢ 5¢ net
Boynton's Noon Day.....	50¢ gro \$5.00
Factor Frisde Stove Enamel.....	50¢ gro \$13.00
Yates' Liquid.....	50¢ 3 16 gal cans
Yates Standard Paste Polish, 10 lb cans.....	50¢ 1.00 80 70 60
Jet Black.....	50¢ 15¢
Japanese.....	50¢ gro \$3.50
Firesteel.....	50¢ gro \$3.50
Diamond O. K. Enamel.....	50¢ gro \$3.50
Bonnell's Liquid Stove Polish.....	50¢ gro \$12.00
Bonnell's Paste Stove Polish.....	50¢ gro \$6.00
Black Eagle Benzine Paste, 5 and 10 lb cans.....	50¢ 12¢
Black Jack Water Paste, 5 and 10 lb cans.....	50¢ 12¢
Nickel Plate Paste.....	50¢ gro \$6.00
Tacks, Brads, &c.—	
<i>List, Jan. 2, 1888. (Note.—Some manufacturers are selling Tacks at slightly higher prices than those named.)</i>	
American Iron Carpet.....	80¢80¢25¢
Steel Carpet.....	80¢80¢25¢
Swedes Iron Carpet.....	80¢80¢25¢
American Iron Cut.....	75¢75¢10¢
Swedes Iron.....	75¢5¢75¢10¢
Swedes Iron, Upholsterers'.....	75¢10¢75¢10¢5¢
Tinned Swedes Iron.....	75¢10¢75¢10¢5¢
Tinned Swedes Iron, Upholsterers'.....	75¢10¢75¢10¢5¢
Gimp and Lace.....	75¢10¢75¢10¢5¢
Tinned Gimp and Lace.....	75¢10¢75¢10¢5¢
Swedes Iron Trimmers.....	75¢10¢75¢10¢5¢
Swedes Iron Miners'.....	75¢10¢75¢10¢5¢
Swedes Iron Bill Posters' or Railroad.....	75¢10¢75¢10¢5¢
Swedes Steel (Swedes Iron price list).....	80¢80¢25¢
Copper Tacks.....	50¢10¢
Copper Finishing, Trunk and Clout Nails.....	50¢10¢
Finishing Nails.....	70¢10¢70¢10¢10¢
Trunk and Clout Nails.....	70¢10¢70¢10¢10¢
Tinned Trunk and Clout Nails.....	70¢10¢10¢
Basket Nails.....	70¢10¢70¢10¢10¢
Common and Patent Brads, 70¢10¢70¢	
Hungarian Nails.....	70¢10¢70¢10¢10¢
Chair Nails.....	70¢10¢70¢10¢10¢
Zinc Glaziers' Points.....	50¢50¢5¢
Cigar Box Nails.....	50¢10¢50¢10¢5¢
Picture-Frame Points.....	50¢10¢50¢10¢5¢
Looking-Glass Tacks.....	50¢10¢50¢10¢5¢
Leathered Carpet.....	50¢10¢50¢10¢5¢
Brush Tacks.....	50¢10¢50¢10¢5¢
Shoe Finders, List Jan. 2, 1888.....	10¢10¢
Lining and Saddle Nails, List Jan. 1, 1888.....	10¢10¢5¢
Silvered.....	80¢10¢10¢
Japanned.....	20¢10¢10¢
Double-Pointed Tacks.....	50¢
Wire Carpet Nails.....	50¢10¢
Wire Brads & Nails, see Nails, Wire.....	50¢10¢
Steel-Wire Brads, K. & E. Mfg. Co.'s list.....	50¢10¢
Tap Borers—	
Common and Rind.....	20¢10¢
Ive's Tap Borers.....	35¢25¢
Enterprise Mfg. Co.....	30¢10¢50¢
Clark's.....	35¢25¢
Tapes, Measuring—	
American.....	25¢10¢
Spring.....	40¢
Chesterman's, Regular list.....	25¢30¢
Thermometers—	
Tin Case.....	80¢80¢10¢
Thimble Skeins—See Skeins.	
Ties, Bale-Steel	
Standard Wire, list.....	50¢10¢25¢
Tinners' Shears, &c.—	
Shears and Snips (P. S. & W.).....	20¢25¢
Punches, see Punches.....	
Snips, J. Mallinson & Co.....	35¢45¢
Tinware—	
Stamped, Japanned and Pieced, list Jan. 20, 1887.....	75¢75¢5¢
Tire Benders, Upsetters, &c.—	
Stoddard's Lightning Tire Upsetters.....	15¢
Detroit Perfected Tire Bender.....	15¢
Tobacco Cutters—	
Champion.....	20¢10¢30¢
Wood Bottom.....	50¢ doz \$5.00-5.25
All Iron.....	50¢ doz \$4.25
Nashua Lock Co.'s.....	50¢ doz \$18.00 50¢55¢
Wilson's.....	50¢ doz \$24, dis 55¢10¢
Sargent's.....	50¢ doz \$24, dis 55¢10¢
Acme.....	50¢ doz \$20.00, dis 40¢
Transom Lifters—	
Wollensak's Class 3 and 4, Bronzed Iron.....	50¢
Class 3 and 4, Bronze Metal.....	35¢
Class 3 and 4, Brass.....	35¢
Skylight Lifters.....	35¢
Crown, Eagle and Shield.....	50¢
Reiber's Bronzed Iron Rods, list Jan. 1, 1887.....	50¢10¢25¢
Reiber's Real Bronze or Nickel Plate.....	50¢25¢
Excelsior.....	50¢10¢25¢
Shaw's.....	50¢10¢
Payson's Universal.....	40¢40¢10¢
Traps—	
Game—	
Newhouse.....	75¢40¢25¢
Oneida Pattern.....	30¢70¢25¢
Game, Blake's Patent.....	40¢10¢25¢
House and Rat.....	50¢
Mouse Wood Choker.....	50¢ doz \$1.10-1.25
Mouse, Round Wire.....	50¢ doz \$1.50, dis 10¢
Mouse, Cage Wire.....	50¢ doz \$2.50, dis 10¢
Mouse, Catch-em-alive.....	50¢ doz \$2.50, dis 10¢
Mouse, "Bonanza".....	50¢ gr \$10.00 net
Mouse Delusion.....	50¢ gr \$18.00, dis 15¢
Rat, "Decoy".....	50¢ gr \$10.00
Ideal.....	50¢ gr \$5.25
Cyclone.....	50¢ gr \$5.25
Hotchkiss Metallic Mouse, 5-hole traps.....	50¢ doz 90¢
In full cases.....	50¢ doz 75¢
Trowels—	
Lothrop's Brick and Plastering.....	25¢
Reed's Brick and Plastering.....	15¢
Dixton's Brk and Plastering.....	25¢25¢10¢
Peace's Plastering.....	25¢
Clement & Maynard's.....	25¢
Rose's Brick.....	15¢25¢
Brads' Brick.....	25¢
Worrall's Brick and Plastering.....	20¢
Garden.....	70¢
Trucks, Warehouse, &c.—	
B. & L. Block Co.'s list.....	82..... 40¢
Tubes, Boiler—	
See Pipe.....	
Twine—	
Flax Twine.....	BC. B.
No. 9, 1/4 and 1/2 B Balls.....	22¢ 30¢
No. 12, 1/4 and 1/2 B Balls.....	21¢ 29¢
No. 15, 1/4 and 1/2 B Balls.....	18¢ 28¢
No. 18, 1/4 and 1/2 B Balls.....	16¢ 27¢
No. 24, 1/4 and 1/2 B Balls.....	14¢ 25¢
No. 28, 1/4 and 1/2 B Balls.....	12¢ 24¢
No. 32, 1/4 and 1/2 B Balls.....	10¢ 22¢
No. 36, 1/4 and 1/2 B Balls.....	8¢ 20¢
No. 40, 1/4 and 1/2 B Balls.....	6¢ 18¢
No. 44, 1/4 and 1/2 B Balls.....	4¢ 16¢
No. 48, 1/4 and 1/2 B Balls.....	2¢ 14¢
Chalk Line, Cotton, 1/2 B Balls.....	25¢
Mason Line, Linen, 1/2 B Balls.....	55¢
2-Ply Hemp, 1/4 and 1/2 B Balls (Spring Twine).....	12¢ 11¢
3-Ply Hemp, 1/4 B Balls.....	11¢ 11¢
3-Ply Hemp, 1/2 B Balls.....	11¢ 11¢
Cotton Wrapping, 5 Balls to lb.....	15¢10¢
2, 3, 4 and 5-Ply Jute, 1/2 B Balls.....	10¢
Wool.....	61¢60¢
Paper.....	13¢14¢
Cotton Mops, 6, 9, 12 and 15 lb to doz.....	18¢
Vises—	
Solid Box—	
Parallels.....	60¢60¢25¢
Fisher & Norris Double Screw.....	15¢10¢
Stephens.....	25¢30¢
Parker's.....	
Wheeler's.....	30¢25¢
Howard's.....	40¢
Bonney's.....	40¢10¢
Millers Falls.....	40¢40¢10¢
Trenton.....	40¢5¢40¢10¢
Merrill's.....	15¢20¢
Sargent's.....	60¢10¢10¢
Beckus and Union.....	40¢
Double Screw Leg.....	15¢10¢
Prentiss.....	30¢5¢35¢
Simpson's Adjustable.....	40¢
Saw Files—	
Bonney's, Nos. 2 & 3, \$15.00.....	dis 40¢10¢
Stearns.....	33¢4¢10¢33¢4¢10¢10¢
Stearns' Silent Saw Vices.....	35¢25¢
Sargent's.....	60¢10¢
Hopkins.....	50¢ doz \$17.50, dis 10¢
Reading.....	4

CURRENT METAL PRICES.

FEBRUARY 6, 1889.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market reports.

IRON AND STEEL.

Bar Iron from Store.

Common Iron:

3/4 to 2 in. round and square...	\$ 1.90 @ ...
1 to 6 in. x 3/4 to 1 in.	2.00 @ ...

Red Iron:

3/4 to 2 in. round and square...	\$ 2.00 @ 2.10
1 to 4 in. x 3/4 to 1 1/2 in.	2.20 @ 2.30
4 1/2 to 6 in. x 3/4 to 1 in.	2.30 @ 2.40
1 to 6 in. x 1 1/4 and 5-16	2.40 @ 2.50

Rods—3/4 and 1-16 round and sq. ... \$ 2.10 @ 2.20

Bands—1 to 6 x 3-16 to No. 12 ... \$ 2.20 @ 2.30

"Burden Best" Iron, base price. ... \$ 3.00 @ ...

Burden's "H. B. & S." Iron, base price. ... \$ 2.80 @ ...

"Luster" ... \$ 3.10 @ ...

Norway Rods ... \$ 4.00 @ 5.00

Merchant Steel from Store.

Open-Hearth and Bessemer Machinery, Tor Calk, Tire and Sleigh Shoe, base price in small lots. ... \$ 2 1/2

Best Cast Steel, base price in small lots ... \$ 5 1/2

Best Cast Steel Machinery, base price in small lots ... \$ 5

Sheet Iron from Store.

Common American.	R. G. Cleaned.
16 to 18 ... \$ 2.75 @ 2.80	3.25 @ 3.50
17 to 20 ... \$ 2.85 @ 2.90	3.25 @ 3.50
21 to 24 ... \$ 3.00 @ 3.10	3.50 @ 3.75
25 and 26 ... \$ 3.30 @ 3.40	3.50 @ 3.75
27 ... \$ 3.35 @ 3.40	3.75 @ 4.00
28 ... \$ 3.50 @ 3.60	4.00 @ 4.25

B. B.

Galv'd, 14 to 20 ... \$ 4.50 @ 4.88	2d qual.
Galv'd, 1 to 24 ... \$ 4.87 1/2 @ 4.75	
Galv'd, 25 to 30 ... \$ 5.25 @ 5.15	
Galv'd, 31 to 36 ... \$ 5.63 1/2 @ 5.48	
Galv'd, 37 ... \$ 6.00 @ 5.85	
Galv'd, 38 ... \$ 6.00 @ 5.85	

Patent Plated ... \$ 10 1/2 @ 10 1/4

Russia ... \$ 9 1/2 @ 9 1/4

American Cold Rolled B. B. ... \$ 5 1/2 @ 5 1/4

English Steel from Store.

Best Cast ... \$ 15 @
Extra Cast ... \$ 16 1/2 @
Swaged, Cast ... \$ 16 @
Best Double Shear ... \$ 15 @
Blister, 1st quality ... \$ 12 1/2 @
German Steel, Best ... \$ 10 @
2d quality ... \$ 9 @
3d quality ... \$ 8 @
Sheet Cast Steel, 1st quality ... \$ 15 @
2d quality ... \$ 14 @
3d quality ... \$ 12 1/2 @

METALS.

Tin.

Banca, Pigs ... \$ 23 1/2 @
Straits, Pigs ... \$ 23 1/2 @
English, Pigs ... \$ 23 1/2 @
Straits in Bars ... \$ 24 1/2 @

Tin Plates.

Charcoal Plates.—Bright.

Melny Grade.	Per box.
IC, 10 x 14 ... \$ 5.75 @ \$ 6.00	
IC, 12 x 12 ... 6.00 @ 6.25	
IC, 14 x 20 ... 5.75 @ 6.00	
IC, 20 x 28 ... 12.00 @ 12.50	
IX, 10 x 14 ... 7.25 @ 7.50	
IX, 12 x 12 ... 7.50 @ 7.75	
IX, 14 x 20 ... 7.25 @ 7.50	
IX, 20 x 28 ... 15.00 @ 15.50	
DC, 12 1/2 x 17 ... 5.50 @ 5.75	
DX, 12 1/2 x 17 ... 7.00 @ 7.25	

Call and Grade.

IC, 10 x 14 ... 5.75 @ 6.00
IC, 12 x 12 ... 6.00 @ 6.25
IC, 14 x 20 ... 5.75 @ 6.00
IX, 10 x 14 ... 7.25 @ 7.50
IX, 12 x 12 ... 7.50 @ 7.75
IX, 14 x 20 ... 7.25 @ 7.50

Allaway Grade.

IC, 10 x 14 ... 5.00 @ 5.12 1/2
IC, 12 x 12 ... 5.12 1/2 @ 5.25
IC, 14 x 20 ... 5.00 @ 5.12 1/2
IX, 10 x 14 ... 11.00 @ 11.25
IX, 12 x 12 ... 6.00 @ 6.25
IX, 14 x 20 ... 6.00 @ 6.25
IX, 20 x 28 ... 12.00 @ 12.50
DC, 12 1/2 x 17 ... 4.75 @ 5.00
DX, 12 1/2 x 17 ... 5.75 @ 6.00

Coke Plates.—Bright.

Steel Coke.—IC, 10 x 14, 14 x 20 ... \$ 4.75 @ \$ 5.00
10 x 20 ... 7.25 @ 7.50
30 x 28 ... 9.75 @ 10.25
IX, 10 x 14, 14 x 20 ... 5.50 @ 5.75
BV Grade.—IC, 10 x 14, 14 x 20 ... 4.40 @ 4.60

Charcoal Plates.—Terne.

Dean Grade.—IC, 14 x 20 ... \$ 4.40 @ \$ 4.62 1/2
20 x 28 ... 9.00 @ 9.25
IX, 14 x 20 ... 4.40 @ 4.62 1/2
20 x 28 ... 11.00 @ 11.25
Abecarse Grade.—IC, 14 x 20 ... 4.25 @ 4.50
20 x 28 ... 8.50 @ 9.00
IX, 14 x 20 ... 5.25 @ 5.50
20 x 28 ... 10.50 @ 10.80

Tin Boiler Plates.

IX, 14 x 20 ... 112 sheets ... \$ 12.50 @ \$ 12.75
IX, 14 x 28 ... 112 sheets ... 12.75 @
IX, 14 x 36 ... 112 sheets ... 14.25 @

Copper.

Duty: Pig. Bar and Ingot. 4¢; Old Copper, 3¢; which Copper is a component of chief value, 4¢ ad valorem.

Ingot.

Lake ... @ 17 ¢ @ 17 1/2 ¢
"Anchor" Brand ... @ 16 1/2 ¢ @ 17 ¢

Prices adopted by the Association of Copper Manufacturers of the United States, December 10, 1887, being quotations for all sized lots.

Sheet and Bolt.

Not wider than	Not longer than	And longer than	Over 64 oz.	82 to 64 oz.	16 to 82 oz.	14 to 16 oz.	12 to 14 oz.	10 to 12 oz.	8 to 10 oz.	Less than 8 oz.
30—72	35	25	25	26	27	28	31	33		
30—72	35	25	25	26	27	28	31	33		
36—96	35	25	25	26	27	28	31	33		
36—96	35	25	25	26	27	28	31	33		
48—96	35	25	25	26	27	28	31	33		
48—96	35	25	25	26	27	28	31	33		
60—96	35	25	25	26	27	28	31	33		
60—96	35	25	25	26	27	28	31	33		
84—96	35	25	25	26	27	28	31	33		
84—96	35	25	25	26	27	28	31	33		
Over 84 in. wide	28	30								

All Bath Tub Sheets ... 16 oz. 14 oz. 12 oz. 10 oz. Per pound. ... \$0.33 0.30 0.32 0.35

Bolt Copper, 3/4 inch diameter and over, per pound. ... 25¢

Circles, 60 inches in diameter and less, 3 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Circles, over 60 inches diameter, up to 96 inches diameter, inclusive, 5 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Circles, over 96 inches diameter, 6 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Segment and Pattern Sheets, 3 cents per pound advance over price of sheets required to cut them from.

Cold or Hard Rolled Copper, 14 ounces per square foot and heavier, 1 cent per pound over the foregoing prices.

Cold or Hard Rolled Copper, lighter than 14 ounces per square foot, 2 cents per pound over the foregoing prices.

Copper Bottoms, Pits and Flats.

14 ounce to square foot and heavier ... 28¢

12 ounce and up to 14 ounce to square foot ... 29¢

10 ounce and up to 12 ounce ... 31¢

Circles less than 8 inches diameter 2 cents per pound additional.

Circles over 18 inches diameter are not classed as Copper Bottoms.

Tinning.

Tinning sheets on one side, 10, 12 and 14 x 48 each ... 8¢

Tinning sheets on one side, 30 x 60 each ... 30¢

For tinning boiler sizes, 9 in. (sheets 14 in. x 60 in.), each ... 15¢

For tinning boiler sizes, 8 in. (sheets 14 in. x 56 in.), each ... 12¢

For tinning boiler sizes, 7 in. (sheets 14 in. x 52 in.), each ... 12¢

Tinning sheets on one side, other sizes, per square foot ... 2¢

For tinning both sides double the above prices.

Planished Copper.

Planished Copper List May 5, 1888 ... Net

Brass and Copper Tubes.

Seamless Copper.	Seamless Brass.
3/4 inch ... \$ 50¢ @ 44¢	3/4 inch ... \$ 47¢ @ 41¢
1/2 inch ... 44¢ @ 38¢	1/2 inch ... 41¢ @ 35¢
3/8 inch ... 40¢ @ 34¢	3/8 inch ... 37¢ @ 31¢
1/4 inch ... 34¢ @ 28¢	1/4 inch ... 31¢ @ 25¢
1/8 inch ... 28¢ @ 22¢	1/8 inch ... 25¢ @ 19¢

Roll and Sheet Brass.

Discount from list ... 10 @ 15 %

Spelter.

Duty: Pig. Bars and Plates, \$1.50 @ 100 lb. ... 5 1/2 ¢ @ 6 ¢

Western Spelter ... 5 1/2 ¢ @ 6 ¢

"Bergensport" ... 7 1/2 ¢ @ 8 ¢

"Bertha" ... 7 1/2 ¢ @ 8 ¢

Zinc.

Duty: Sheet, 2 1/2 ¢ @ lb. ... 6 1/2 ¢

600 lb casks ... 7 1/2 ¢

Per lb ... 7 1/2 ¢

Lead.

Duty: Pig. \$2 @ 100 lb. Old Lead, 2¢ @ lb. Pipe and Sheets, 3¢ @ lb.

American ... 4 1/2 ¢

Newark ... 4 1/2 ¢

Bar ... 5 1/2 ¢

Pipe, subject to trade discount ... 6 1/2 ¢

Tin-Lined Pipe, subject to trade discount ... 15¢

Block Tin Pipes, subject to trade discount ... 45¢

Sheet, subject to trade discount ... 7 1/2 ¢

Solder.

1/2 @ 1/4 (Guaranteed) ... 16¢

Extra Wiping ... 13 1/2 ¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony.

Cookson ... \$ 13 1/2 ¢ @ 14 ¢

Hallett's ... 1 ¢ @ 12 ¢

Plumbers' Brass Work.

Discount per cent.

Ground Bibbs and Stops ... 55¢ @ 102¢

Ground Stops, Hydrant Cocks, &c. ... 55¢ @ 102¢

Corporation Cocks ... 55¢ @ 102¢

Corporation Cocks, "Mueller" Pattern, from Western list.

Ground Basin and Shampooing Cocks ... 50¢ @ 102¢
Compression Basin Cocks ... 50¢ @ 102¢
Compression Basin and Sink Cocks ... 50¢ @ 102¢
Compression Pantry Cocks ... 50¢ @ 102¢
Compression Double Basin and Shampooing Cocks ... 50¢ @ 102¢
Compression Double Bath Cocks ... 50¢ @ 102¢
Compression Bibbs, Urinal Cocks, Still Cocks, Stops, Hopper Cocks, Hydrant Cocks and Ball Cocks ... 50¢ @ 102¢
Basin Plugs and Basin Grates ... 55¢ @ 102¢
Bath and Wash Tray Plugs ... 55¢ @ 102¢
Bath Wastes and Washers, Bath and Basin Valves, Sewer and Vacuum Valves, Cistern Valves, Pump Valves and Strainers, Ship Closet Valves and Suction Baskets ... 55¢ @ 102¢
Basin Clamps, Basin Joints and Strainers ... 55¢ @ 102¢
Boiler Couplings, Ground Face, per set \$1.25 ... 10
Boiler Couplings, Plain Face, per set \$1.30 ... 10
Water Back Valve and Plain Couplings, Soldering Nipples and Unions ... 50¢ @ 102¢
Union Joints ... 50¢ @ 102¢
Hydrant Nozzles, Handles and Guides, Sockets and Clamps, Street Washer Screws and Guides ... 55¢ @ 102¢
Hose Goods ... 55¢ @ 102¢

Steam and Gas Fitters' Brass and Iron Work.

Discount per cent.
Brass Globe Valves ... 60¢ @ 102¢
Finished Brass Globe Valves, with Finished Brass Wheels ... 60¢ @ 102¢
Brass Globe Valves, with Patent Wood Wheels ... 60¢ @ 102¢
Brass Globe Angle and Corner Valves ... 60¢ @ 102¢
Brass Radiator Angle Valves ... 60¢ @ 102¢
Brass Radiator Angle Valves, Frink's Patent ... 60¢ @ 102¢
Brass Cross and Check Valves ... 60¢ @ 102¢
Brass Check Valves ... 60¢ @ 102¢
Brass Hose Valves ... 60¢ @ 102¢
Brass and Iron Frink Valves ... 60¢ @ 102¢
Brass Safety Valves ... 60¢ @ 102¢
Brass Vacuum Valves ... 60¢ @ 102¢
Brass Whistle Valves ... 60¢ @ 102¢
Brass Balance, Back-Pressure and Foot Valves ... 60¢ @ 102¢
Brass Butterfly and Throttle Valves ... 60¢ @ 102¢
Brass Pump Valves ... 60¢ @ 102¢
Brass Steam Cocks ... 60¢ @ 102¢
Brass Service, Meter and Union Meter Cocks ... 60¢ @ 102¢
Brass Whistles, Water Gauges and Oil Cups ... 60¢ @ 102¢

Brass Hollow Plug, Tallow and Globe Oil Cups.

Brass Lubricators ... 60¢ @ 102¢
Brass Air Valves ... 60¢ @ 102¢
Brass Air Cocks ... 60¢ @ 102¢
Brass Gauge Cocks ... 60¢ @ 102¢
Brass Cylinder Cocks and Steam Bibbs ... 60¢ @ 102¢
Brass Swing Joints and Expansion Joints ... 60¢ @ 102¢
Brass Test Pumps ... 60¢ @ 102¢
Brass Steam Fittings, Rough ... 60¢ @ 102¢
Brass Steam Fittings, Finished ... 60¢ @ 102¢
Brass Union Joints ... 60¢ @ 102¢
Brass Soldering Unions and Nipples ... 60¢ @ 102¢
Brass Hose Fittings, Fusible and Boiler Plugs ... 60¢ @ 102¢
Iron Body Globe, Angie, Cross and Check Valves ... 60¢ @ 102¢
Iron Body Safety, Throttle, Back Pressure, Butterfly and Foot Valves ... 60¢ @ 102¢
Iron Cocks, all Iron ... 60¢ @ 102¢
All Iron Valves ... 60¢ @ 102¢

Miscellaneous.

Discount per cent.
Cast Iron Fittings ... 70¢ @ 10
Plugs and Bushings ... 75¢ @ 10
Malleable Iron Unions ... 67 1/2 ¢
Malleable Iron Fittings ... 67 1/2 ¢

Paints.

Black, Lamp—Coach Painters' ... \$ 22 @ 24¢
Ordinary ... 6¢
Black, Ivory Drop, fair ... 12 @ 15¢
best ... 24¢
Black Paint in oil, kegs, 8¢; assorted cans, 11¢
Blue, Prussian, fair to best ... 40 @ 55¢
in oil ... 45 @ 55¢
"Chinese dry ... 70¢
Ultramarine ... 18 @ 30¢
Brown, Spanish ... 14¢
Van Dyke ... 10 @ 12¢
Dryers, Patent American, ass'd cans, 6¢; kegs, 7¢
Green, Chrome ... 15 @ 25¢
Green, Chrome in oil ... 14 @ 18 @ 25¢
Green, Paris ... good, 30¢; best, 35¢
Green, Paris in oil ... good, 30¢; best, 35¢
Iron Paint, Bright Red ... \$ 24 @ 24¢
Iron Paint, Brown ... \$ 14 @ 14¢
Iron Paint, Purple ... \$ 14 @ 14¢
Iron Paint, Ground in oil, Bright Red ... \$ 14 @ 14¢
Iron Paint, Ground in oil, Red ... \$ 14 @ 14¢
Iron Paint, Ground in oil, Brown ... \$ 14 @ 14¢
Iron Paint, Ground, Purple ... \$ 14 @ 14¢
Litharge ... 6¢
Mineral Paints ... 2 @ 4¢
Orange Mineral ... 10¢
Red Lead, American ... 6¢
Red Venetian (Eng.) dry ... \$1.65 @ \$1.70
Red Venetian in oil ... ass't'd cans, 11¢; kegs, 6¢
Red Indian Dry ... 9 @ 12¢
Rose Pink ... 10 @ 13¢

THE IRON AGE

THURSDAY, FEBRUARY 14, 1889.

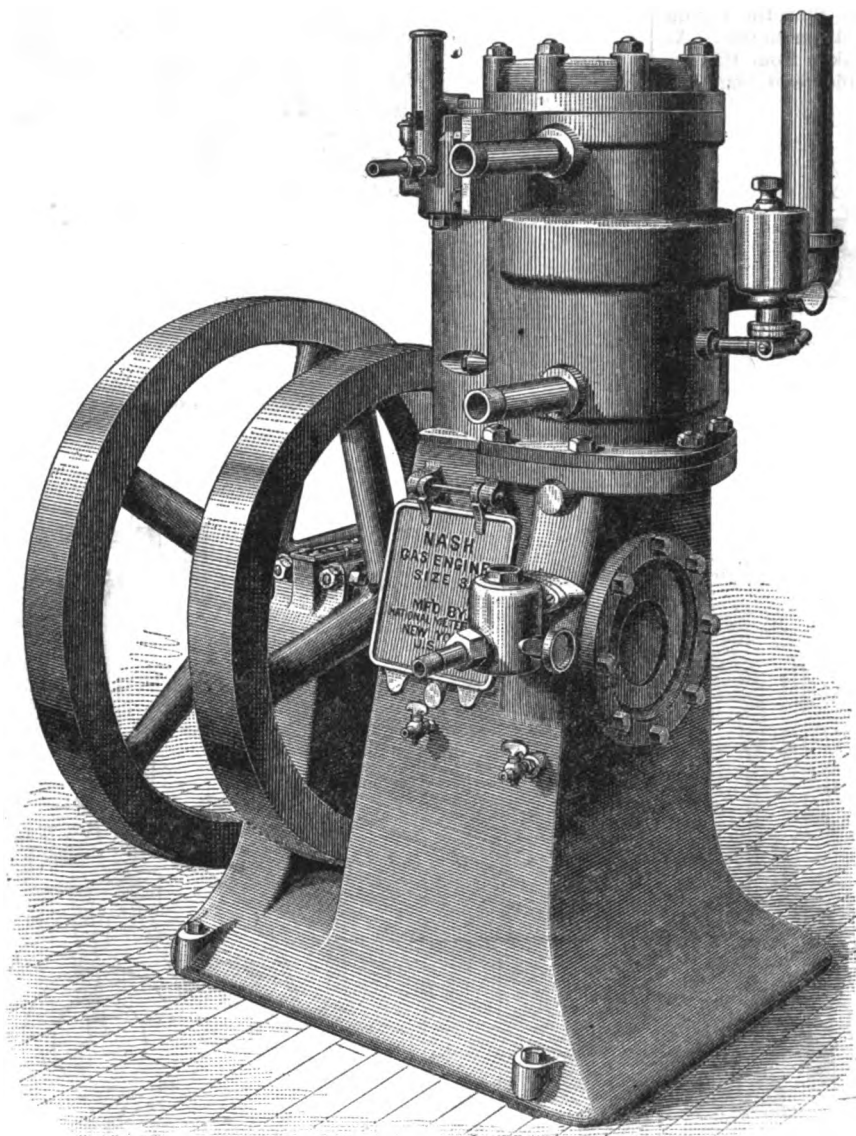
The Nash Gas Engine.

Several important considerations governed the designing of the engine of which we present a perspective and sectional drawings. It was aimed to operate the engine with a combustible mixture always of uniform proportions; to provide for governing; to supply the mixture as fast as used; to prevent the premature ignition of the charge; to prevent the flame in the

through the mixing valve shown in Fig. 3, which is placed externally as represented in Fig. 2. This valve automatically regulates the relative proportional supply of gas and air to the cylinder, so that the charge is of uniform quality and density. Air enters through the opening at the bottom, while the flow of gas is regulated by the valve *f*. In the interior are two valve ports of unequal area, with which a double-seated valve, *i*, operates by its weight verti-

trolled by the valve *k* operated by the governor *n*.

The ignitor *b*, Fig. 1, and shown enlarged in Fig. 4, is based upon a new principle. The igniting jet of combustible mixture is caused to rotate in the circular chamber *r*, into which it enters through a passage tangentially placed. This forms a vortex of plane which is positive in its action and simple. The valve itself, *B*, is made of steel, and is



THE NASH GAS ENGINE, BUILT BY THE NATIONAL METER COMPANY OF NEW YORK.

power cylinder from being communicated back to the supply reservoir; to prevent the leakage of the supply valve from fouling the supply for the engine; and to provide for the admission of the charge, its ignition, prevent the fouling of the supply, and prevent the back passage of the flame by a poppet valve.

The combustion or power chamber is formed partly in a separate hood and communicates at one side of the latter with the supply valve port. The forward end of the power cylinder opens into a casing of the base, which forms a compression supply chamber of which the piston is the compressor. In this chamber work the connecting rod and crank, and into it the combustible mixture of gas and air is drawn during the upward stroke of the piston

cally to control the flow of gas through the smaller valve and the flow of air through the other. It is evident that the relative quantities of air and gas drawn in by the suction created by the upward movement of the piston will be in accordance with the size of the air and gas openings. The valve is made of sufficient weight to greatly overcome the gas pressure, so that any slight variations in the latter will not materially affect the proportions of the parts of the mixture.

From the supply reservoir the mixture passes upward through a passage clearly shown in Fig. 1. Its admission to the combustion chamber above the piston is controlled by a valve of the poppet type, having an ample bearing seat. The quantity of gas admitted at each stroke is con-

hardened and ground to size. It moves in a reamed hole in the case, being so loosely fitted as to drop of its own weight, and yet making a gas-tight joint. Since the valve is perfectly balanced as to gas pressure, it moves without friction, and therefore requires a very small quantity of oil—just sufficient to prevent it becoming dry. The valve is made long, and the lower part has a bearing in that part of the case kept cool by a water jacket. As oil is only applied to the lower end, very little can work up to the hot end where the ignitor is heated; hence the formation of gummy oil is prevented and the valve seldom needs cleaning. In actual use it has been found that the case and upper end of the valve never come into metallic contact, as, on account of the looseness of fit

at that point, a scale of hard carbon is formed over the surface of each, which protects them from abrasion. The valve is positively operated by an eccentric on the shaft. The piston connection, shown clearly in Fig. 2, is unique in design, as it is not "pin connected," and as it operates without friction. Held rigidly to the piston is a hardened and ground steel block, against which the end of the connecting-rod, which is also hardened, rests. The rod has no sliding movement; it simply rocks on the bearing pin. It is held in place by a yoke, and as the pressure on the piston is always downward the yoke is not subjected to strain.

The engine ignites its charge at each revolution, and the amount of the charge is controlled at each stroke by a governor, as before mentioned, so that the regulation is as close as for a steam engine. An examination of a card taken from this engine shows a remarkable resemblance to

plosive mixture. The fly-wheel is stationed between two bearings formed in the single base casting, and hence the alignment of the shaft is always true. The working parts are inclosed and protected from

The engine shown in the engraving occupies a floor space of 25 x 85 inches, is 41 inches high, and will develop 2 horsepower. This engine is the invention of L. H. Nash and is manufactured by the

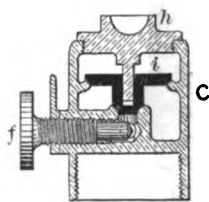


Fig. 3.—Mixing Valve.

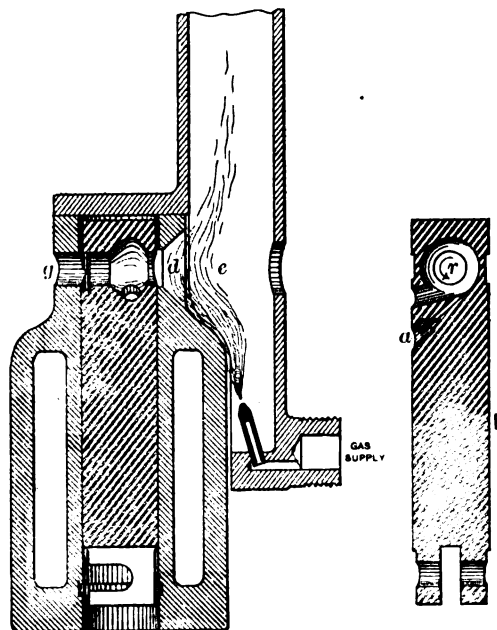


Fig. 4.—Ignition Valve.

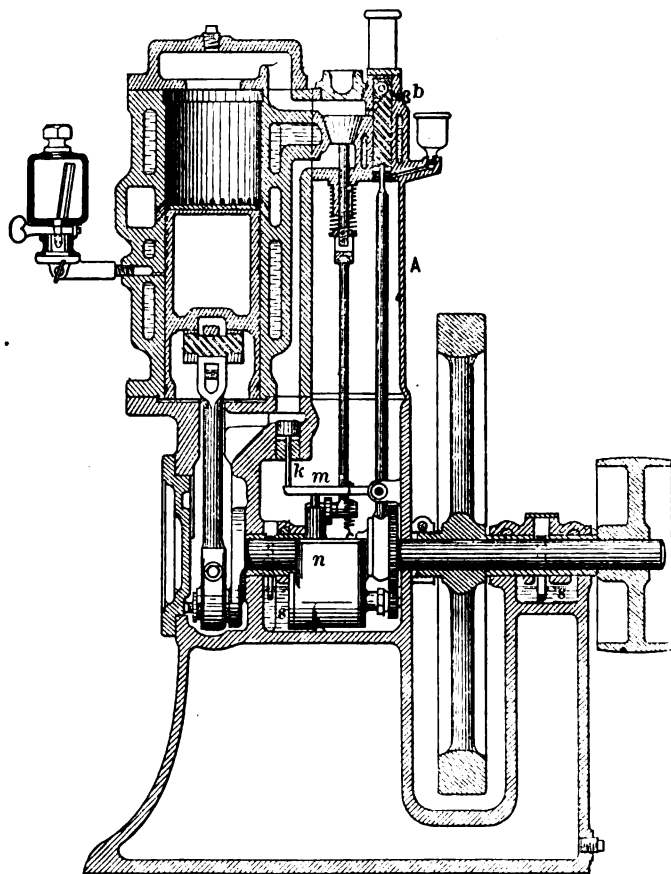


Fig. 1.—Side Sectional Elevation.

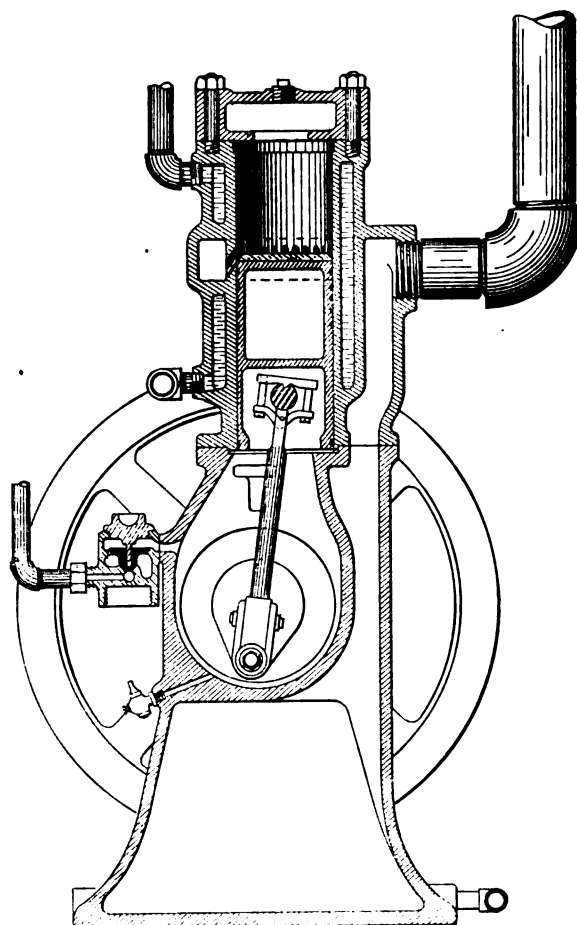


Fig. 2.—End Sectional Elevation.

DETAILS OF NASH GAS ENGINE, BUILT BY THE NATIONAL METER COMPANY OF NEW YORK.

the card of a steam engine. The pressure at the beginning of the stroke is moderate and the line of the expansion is well sustained throughout the entire stroke. There is no sudden shock, and the pressure on the working parts is as easy as if steam were the motive fluid instead of an ex-

dust, and at the same time they are readily accessible by swinging covers. Owing to the high speed attained by the engine, and also to the fact that the piston receives a positive impulse at every stroke, it is especially adapted for work requiring uniform speed, such as electric lighting.

National Meter Company, of 252 Broadway, New York.

It is reported that the Chapin Mine, on the Menominee range, has been leased for 30 years for a cash consideration, and subject to a royalty of 40 cents a ton.

Pipe and Nipple Machine.

The accompanying engravings represent a combined pipe and nipple machine built by the Bignall & Keeler Mfg. Company, of St. Louis. It is adapted to mill use and common job shop work; it cuts and threads both pipe and nipples from $\frac{1}{4}$ to 2

inches inclusive; no change, except of the grippers, is required for either service. The machine need not be stopped to change the pipe, as a simple lever movement opens or closes the chuck at will. Fig. 2 is a longitudinal sectional elevation, broken away, when used as a pipe gripper; Fig. 3 is a front view of the same. The jaws or grippers *a* are fitted radially to the pipe *b*, at right angles to each other, within the carriers or holders *c*, which are arranged in front of the head *d* of the chuck, and are formed in one piece (re-

spectively) with the front end of the levers *e*, which are pivoted in the head *d*, and carried by the chuck. The rear ends of the levers are coupled together by springs, not shown, and are provided with rollers, *f*, for riding over the cone *g*, which surrounds the spindle *h*, and is moved to and fro along the latter for operating the jaws, which are turned by the chuck. The rear ends of the levers are coupled together by springs, not shown, and are provided with rollers, *f*, for riding over the cone *g*, which surrounds the spindle *h*, and is moved to and fro along the latter for operating the jaws, which are turned by the chuck. The rear ends of the levers are coupled together by springs, not shown, and are provided with rollers, *f*, for riding over the cone *g*, which surrounds the spindle *h*, and is moved to and fro along the latter for operating the jaws, which are turned by the chuck.

is prevented by pins bearing against the shoulders *m* of the screws, so that when the latter are turned the jaws will be moved to or from the pipe as required. The outer end of the shank *k* is flush with the outer end of the carrier, and is formed with a key, by which the screw may be turned. When the cone *g* is moved along the spindle by its clutch in the usual manner for diverging the rear arms of the levers, the jaws of the grippers are brought toward the pipe and the rear portions of the gripping edges of the jaws are caused to bite into and grip the pipe somewhat in advance of, and therefore to a greater extent than, the front portion of the edges, and the pipe is more firmly held than when the grippers close upon the pipe at right angles. To increase the gripping force the inclination of the cone at its highest pass is lessened so as to gain more power on the levers at that point. By turning the screws the jaws can be speedily adjusted to different sized pipes. By the use of four jaws in lieu of two, as usual, the pipe is set truer as the grippers close upon it. The slides used for holding the pipe steady while cutting off are operated by a crank and right and left screw on the work side of the machine.

When the machine is used as a nipple chuck, nipple grippers are inserted in place of the pipe grippers, the rest of the chuck being as described. By using four nipple grippers, or quarter sections, the nipple is readily released by operating the chuck with the lever movement and allowing the nipple to drop.

So great is the demand upon the resources of the various shipbuilding yards in the Delaware River and at Wilmington that contracts for early delivery cannot be made. It is stated that the United States and Brazil Mail Steamship Company are

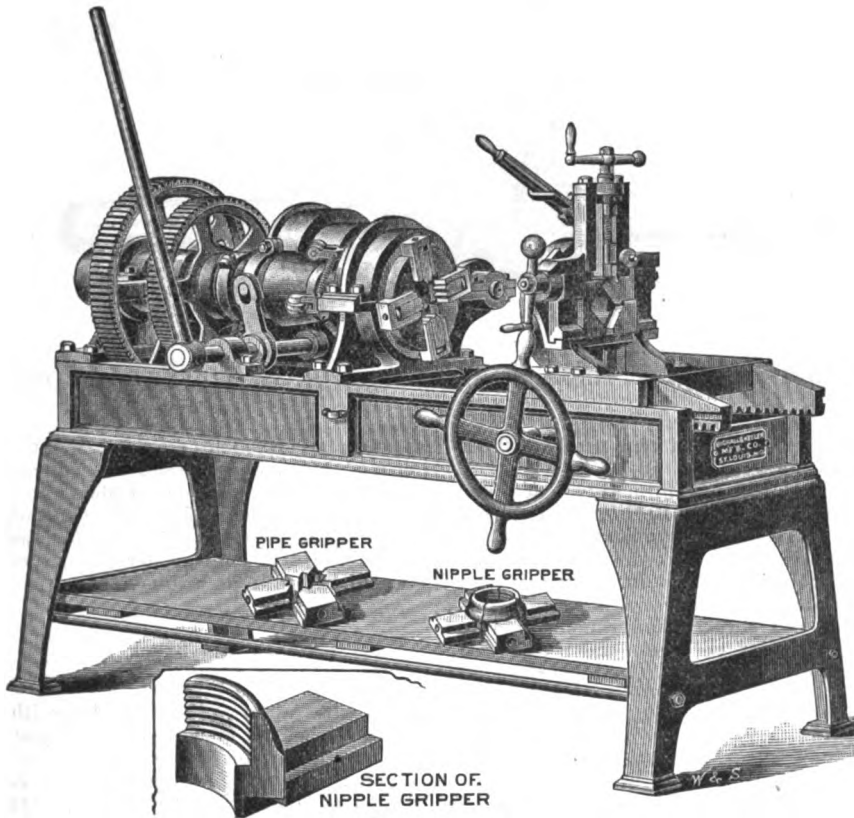


Fig. 1.—Perspective View.

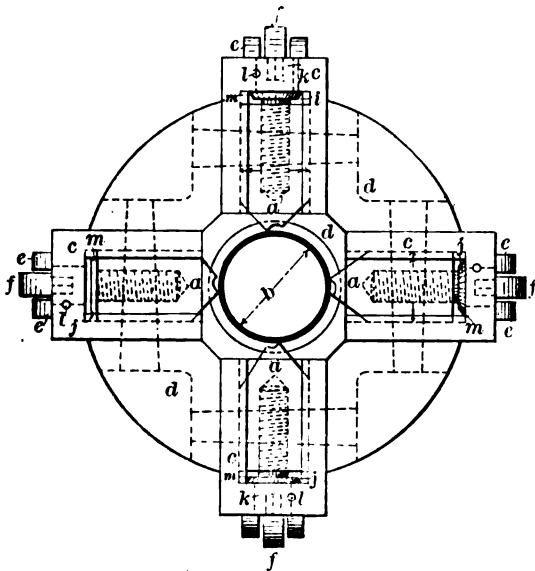


Fig. 3.—Front View of Fig. 2.

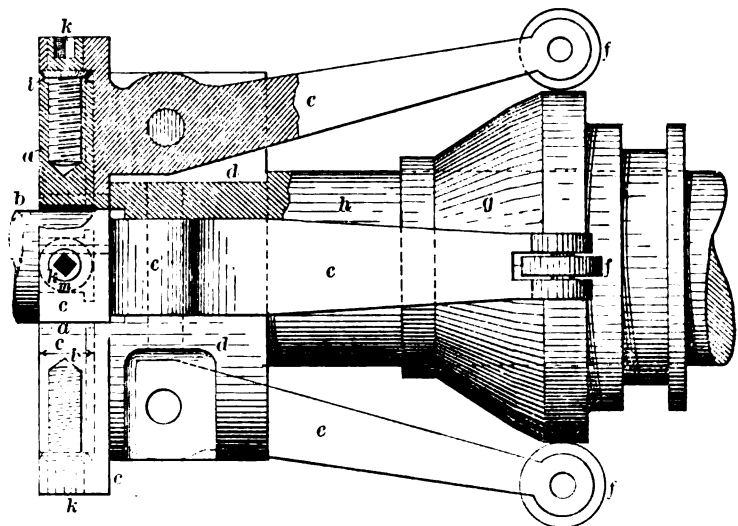


Fig. 2.—Longitudinal Sectional Elevation of Chuck.

PIPE AND NIPPLE MACHINE, BUILT BY THE BIGNALL & KEELER MFG. COMPANY OF ST. LOUIS MO.

levers in the usual manner. The rear edges of the jaws are formed with lateral ribs, and are fitted within grooved recesses, *i*, formed longitudinally in the faces of the carriers *c*, these recesses corresponding in shape to the jaws. The jaws, thus constructed, can be adjusted longitudinally in the recesses by means of adjusting screws, which engage internal threads in the outer ends of the jaws, the shanks *k* of the screws passing through circular openings in the outer ends of the carriers *c*. Longitudinal movement of the screws

unable to procure bids upon two steamers which they want unless willing to wait two years for them to be finished. The ships recently negotiated for include one for the Mallory Steamship Company and two for the New York and Cuba Mail Steamship Company, which will be built at Roach's yard, one for the Morgan Line, and two for the Red D Line, contracted for a William Cramp & Sons, and a steel steamer of 5000 tons displacement, which a Scotch firm is building for the Pacific Mail Steamship Company.

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Tire-Heating Furnace.

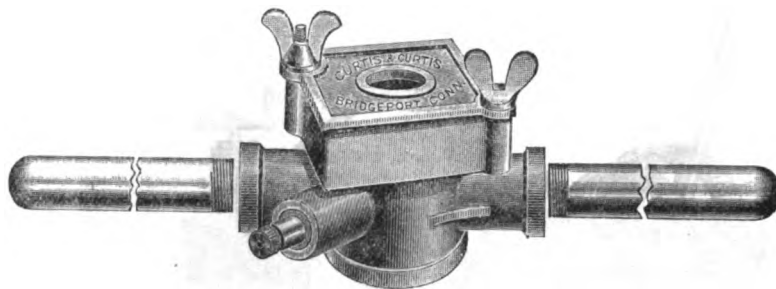
In this furnace the tires rest upon two parallel grooved shafts placed over each side of the fire. The upper parts of the tires are held separated by a wire frame, as shown in the cut. The outer end of each shaft is provided with a sprocket wheel, over which passes a chain leading from a suitable driving shaft. By this means the tires are kept revolving slowly, and each is brought constantly in contact with the fire. The oven itself is heated sufficiently to keep them all at a proper temperature. As fast as one is removed another is put in its place, the heating going on faster than the tires can be put on the wheels, and without the least danger of burning. The fire-box is adapted to burn either coal or wood. This furnace, known as the Duffey, is made by Bradley & Co., of Syracuse, N. Y.

The Blast Furnaces in Allegheny County.

In the future, in our monthly report of the condition of the blast furnaces of the country, we shall reduce the number of coke stacks credited to Allegheny County from 20 to 18. This has been made necessary by the fact that two of the three stacks operated by Laughlins & Co., at Pittsburgh, have been dismantled. These two stacks were blown out some weeks since for the purpose of being relined, and work had already been commenced when one of the stacks fell in, and it was

of about 500 tons per day. This entire amount, or nearly all of it, will be consumed by the firm named above, who are interested in the furnaces. The two stacks which have been dismantled were erected in 1861, and have been in continuous operation since 1882 on one lining, which is certainly a remarkable record. In that time it is estimated that the two

their history. The two stacks of Shoenberger, Speer & Co., are turning out nearly 5000 tons per month. One of them will be blown out in the near future for relining and will also be fitted up with new stoves of the Massicks & Crooke's design. The new Soho Furnace, of the Moorhead-McCleane Company, was put in blast on November 15 last, and thus far



RATCHET DIE STOCK, MADE BY CURTIS & CURTIS, BRIDGEPORT, CONN.

stacks have produced very nearly 500,000 tons of pig iron.

Clinton Furnace, formerly owned and operated by Graff, Bennett & Co., but later operated by a syndicate of creditors of that firm, was banked last month, and will probably not go in blast again for some time, if it ever resumes again. It is a very old furnace and cannot produce over 325 tons per week under the most favorable conditions. Carrie Furnace, of

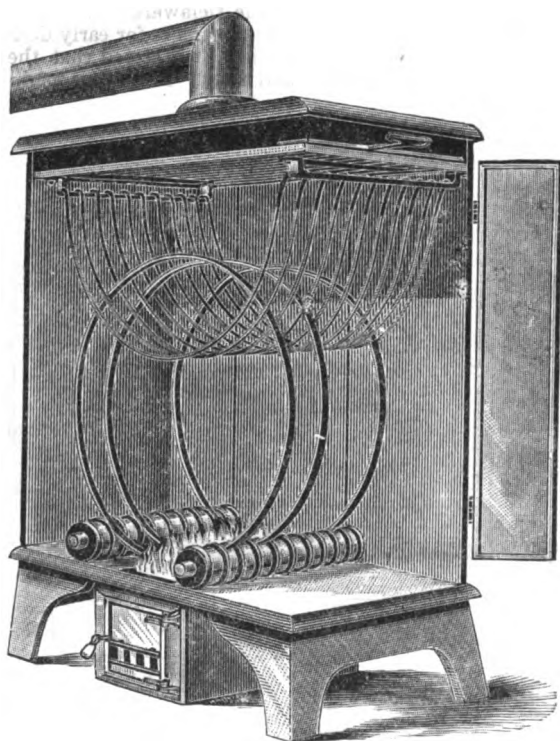
has made an excellent record. For the month of January just closed it produced 5676 gross tons of pig iron. Unless something unforeseen should occur the output of pig iron in Allegheny County for the present year will be considerably larger than ever before in its history.

Ratchet Die Stock.

The illustration presented herewith shows a ratchet die stock which has just been brought out by Curtis & Curtis, of Bridgeport, Conn. The hub, which is threaded at diametrically opposite points to receive the handles, is free to revolve upon the central stock. In the hub is a pawl, pressed inward by a spring, to engage its inner end with suitably formed teeth upon the stock. The pawl may be turned a half revolution, so that the hub and stock may be held to revolve in either direction desirable. During the reverse movement of the handles the hub, of course, turns independently of the center. The ratchet allows the tool to be worked without changing hands, and thus avoids all loss of power and dead centers.

The scheme for the training of mechanics approved by the Master Builders' Exchange, of Philadelphia, provides for the education of boys in a mechanical trade school until they have obtained a certificate of proficiency and a service for a term of practice with an employer, this term to be at least one year less than the usual term of apprenticeship by virtue of the holding of a certificate of proficiency granted by a mechanical trade school. The completion of the education of the mechanic is to be acknowledged on the part of the employer by the granting of a certificate from the association of builders, setting forth that the holder has passed through the prescribed course at the trade school and the term of practice with an employer, and is entitled to be received by all builders as a journeyman. With similar schools established in New York, Philadelphia and Boston, this system will, it is believed, in time afford a substitute in part for the old form of apprenticeship, and be of advantage to both the young men and their employers.

It is reported from Duluth that large works for the production of aluminium are to be erected in that city, but such stories are to be received with reservation, at least until it is positively known that the metal can be manufactured profitably.



DUFFEY TIRE-HEATING FURNACE, BUILT BY BRADLEY & COMPANY, SYRACUSE, N. Y.

then decided by the firm to dismantle both of them, the work having been almost completed already. The new stack completed by this firm in the early part of last year is in operation, and is producing about 250 tons per day, which is all consumed by the American Iron and Steel Works of Jones & Laughlins, Limited. Work on the new stack is progressing rapidly, and it will probably be ready for blast by the middle of March. It will also have a capacity of about 250 tons per day, giving the firm a total production

the Carrie Furnace Company, continues in blast and is making a good record. This firm are also building an additional stack, which will probably be ready for blast not later than April next. It will have a capacity of about 200 tons per day. The nine stacks controlled by Carnegie Bros. & Co., Limited, and Carnegie, Phipps & Co., Limited, are all in blast and producing nearly 60,000 tons of pig iron per month. The two stacks of the Isabella Furnace Company are in blast and producing more pig iron than ever before in

The Bugaboo of Trusts.*

BY ANDREW CARNEGIE.

We must all have our toys; the child his rattle, the adult his hobby, the man of pleasure the fashion, the man of art his master; and mankind in its various divisions requires a change of toys at short intervals. The same rule holds good in the business world. We have had our age of "consolidations" and "watered stocks." Not long ago everything was a "syndicate;" the word is already becoming obsolete, and the fashion is for "trusts," which will in turn no doubt give place to some new panacea, that is in turn to be displaced by another, and so on without end. The great laws of the economic world, like all laws affecting society, being the genuine outgrowth of human nature, alone remain unchanged through all these changes. Whenever consolidations, or watered stocks, or syndicates, or trusts endeavor to circumvent these, it always has been found that the result is after the collision there is nothing left of the panaceas, while the great laws continue to grind out their irresistible consequences as before.

It is worth while to inquire into the appearance and growth of trusts and learn what environs produce them. Their genesis is as follows: A demand exists for a certain article beyond the capacity of existing works to supply it. Prices are high, and profits tempting. Every manufacturer of that article immediately proceeds to enlarge his works and increase their producing power. In addition to this the unusual profits attract the attention of his principal managers or those who are interested to a greater or less degree in the factory. These communicate the knowledge of the prosperity of the works to others. New partnerships are formed, and new works are erected, and before long the demand for the article is fully satisfied, and prices do not advance. In a short time the supply becomes greater than the demand, there are a few tons or yards more in the market for sale than required, and prices begin to fall. They continue falling until the article is sold at cost to the less favorably situated or less ably managed factory; and even until the best managed and best equipped factory is not able to produce the article at the prices at which it can be sold. Political economy says that here the trouble will end. Goods will not be produced at less than cost. This was true when Adam Smith wrote, but it is not quite true to-day. When an article was produced by a small manufacturer, employing, probably at his own home, two or three journeymen and an apprentice or two, it was an easy matter for him to limit or even to stop production. As manufacturing is carried on to-day, in enormous establishments with five or ten millions of dollars of capital invested, and with thousands of workers, it costs the manufacturer much less to run at a loss per ton or per yard than to check his production. Stoppage would be serious indeed. The condition of cheap manufacture is running full. Twenty sources of expense are fixed charges, many of which stoppage would only increase. Therefore the article is produced for months, and in some cases that I have known for years, not only without profit or without interest upon capital, but to the impairment of the capital invested. Manufacturers have balanced their books year after year only to find their capital reduced at each successive balance. While continuing to produce may be costly, the manufacturer knows too well that stoppage would be ruin.

His brother manufacturers are of course in the same situation. They see the savings of many years, as well perhaps as the capital they have succeeded in borrowing, becoming less and less, with no hope of a change in the situation. It is in soil thus prepared that anything promising relief is gladly welcomed. The manufacturers are in the position of patients that have tried in vain every doctor of the regular school for years, and are now liable to become the victims of any quack that appears. Combinations—syndicates—trusts—they are willing to try anything. A meeting is called, and in the presence of immediate danger they decide to take united action and form a trust. Each factory is rated as worth a certain amount. Officers are chosen, and through these the entire product of the article in question is to be distributed to the public at remunerative prices.

Such is the genesis of "trusts" in manufactured articles.

During the recent Presidential campaign it suited the purpose of one of the parties to connect trusts with the doctrine of protection. But trusts are confined to no country and are not in any way dependent upon fiscal regulations. The greatest trust of all just now is the Copper Trust, which is French, and has its headquarters in Paris. The Salt Trust is English, with its headquarters in London. The Wire-rod Trust is German. The only Steel-rail Trust that ever existed was an international one which embraced all the works in Europe. Trusts, either in transportation or manufactures, are the product of human weakness, and this weakness is co-extensive with the race.

There is one huge combination classed with trusts which is so exceptional in its origin and history that it deserves a separate paragraph. I refer to the Standard Oil Company. So favorable an opportunity to control a product perhaps never arose as in the case of petroleum. At an early stage a few of the ablest business men that the world has ever seen realized the importance of the discovery, and invested largely in the purchase of property connected with it. The success of the petroleum business was phenomenal, and so was the success of these people. The profits they made, and, no doubt, as much capital as they could borrow, were fearlessly reinvested, and they soon became the principal owners, and finally, substantially the only owners, of the territory which contained this great source of wealth. The Standard Oil Company would long ago have gone to pieces had it not been managed, upon the whole, in harmony with the laws which control business. It is a hundred to one whether it will survive when the present men at the head retire; or perhaps I should say when the present man retires, for wonderful organizations imply a genius at the head, a commander-in-chief, with exceptionally able corps commanders no doubt, but still a Grant at the head. To those who quote the Standard Oil Company as an evidence that trusts or combinations can be permanently successful, I say wait and see. I have spoken thus freely of that company because I am ignorant of its management, profits and modes of action. I view it from the outside as a student of political economy only, and as such have endeavored to apply to it the principles which I know will have their way no matter how formidable the attempt made to defeat their operation.

We have given the genesis of trusts and combinations in their several forms. The question is, Do they menace the permanent interest of the nation? Are they a source of serious danger? Or are they to prove, as many other similar forms have proved, mere passing phases of unrest and transition? To answer this question let us follow the operation of the manufacturing

trust which we have in imagination created, salt or sugar, nails, beams, or lead or copper; it is all the same. The sugar refiners, let us say, have formed a trust after competing one with another through years of disastrous business, and all the sugar manufactured in the country in existing factories is sold through one channel at advanced prices. Profits begin to grow. Dividends are paid, and those who before saw their property vanishing before their eyes are now made happy. The dividends from that part of a man's capital invested in the sugar business yield him profit far above the capital he has invested in various other affairs. The prices of sugar are such that the capital invested in a new factory would yield enormously. He is perhaps bound not to enlarge his factory or to enter into a new factory, but his relatives and acquaintances soon discover the fresh opportunity for gain. He can advise them to push the completion of a small factory, which, of course, must be taken into the trust. Or, even if he does not give his friends this intimation, capital is always upon the alert, especially when it is bruited about that a trust has been formed, as in the case of sugar, and immediately new sugar manufactories spring up as if by magic. The more successful the trust, the surer these off-shoots are to sprout. Every victory is a defeat. Every factory that the trust buys is the sure creator of another, and so on, *ad infinitum*, until the bubble bursts. The sugar refiners have tried to get more from capital in a special case than capital yields in general. They have endeavored to raise a part of the ocean of capital above the level of the surrounding waters, and over their bulwarks the floods have burst, and capital, like water, has again found its level. It is true that to regain this level a longer or a shorter period may be required, during which the article affected may be sold to the consumer in limited quantities at a higher rate than before existed. But for this the consumer is amply recompensed in the years that follow, during which the struggle between the discordant and competitive factories becomes severer than it ever was before, and lasts till the great law of the survival of the fittest vindicates itself. Those factories and managers that can produce to the best advantage eventually close the less competent. Capital wisely managed yields its legitimate profit. After a time the growth of demand enables capital to receive an unusual profit. This in turn attracts fresh capital to the manufacture, and we have a renewal of the old struggle, the consumer reaping the benefit.

Such is the law, such has been the law, and such promises to be the law for the future; for, so far, no device has yet been devised that has permanently thwarted its operation. Given freedom of competition, and all combinations or trusts that attempt to exact from the consumer more than a legitimate return upon capital and services write the charter of their own defeat. We have many proofs that this great law does not sleep and that it will not be suppressed. Some time ago, as I have stated, the steel rail manufacturers of Europe formed a trust and advanced the price of rails to such an extent that American manufacturers were able for the first and perhaps for the last time to export steel rails to Canada in competition with the European. But the misunderstandings and quarrels, inseparable from these attempted unions of competitors, soon broke the trust. With vindictive feelings, added to what was before business rivalry, the struggle was renewed, and the steel rail industry of Europe has never recovered. It was found that the advance of prices had only galvanized into life concerns which never should have attempted to manufacture rails; and so that trust died a natural death. During the

* Extracts from a paper printed in the February number of the *North American Review*.

great depression which existed for several years in this country in the steel rail trade many anxious meetings were held under circumstances described in the genesis of trusts, and it was resolved that the plan of restricting production should be tried. Fortunately reaction soon came. A demand for rails set in before the plan went into operation, and, as a matter of fact, no restriction of product was ever attempted, and the steel rail industry was thus saved from a great error. We have recently seen the lead trust of this country shattered and its chief owners bankrupted. The newspapers a few weeks ago were filled with accounts of the convention of the growers of cattle in St. Louis, resolved to break down the combination of slaughterers and shippers in Chicago and Kansas City. No business was poorer in this country for many years than the manufacture of nails. It was overdone. To remedy this the manufacturers did not form a trust, so far as the sale of product was con-

insurance and hardware, and 20 more articles; but the fitting epitaph for these ephemeral creations is

"If I was so soon to be done for,
I wonder what I was begun for!"

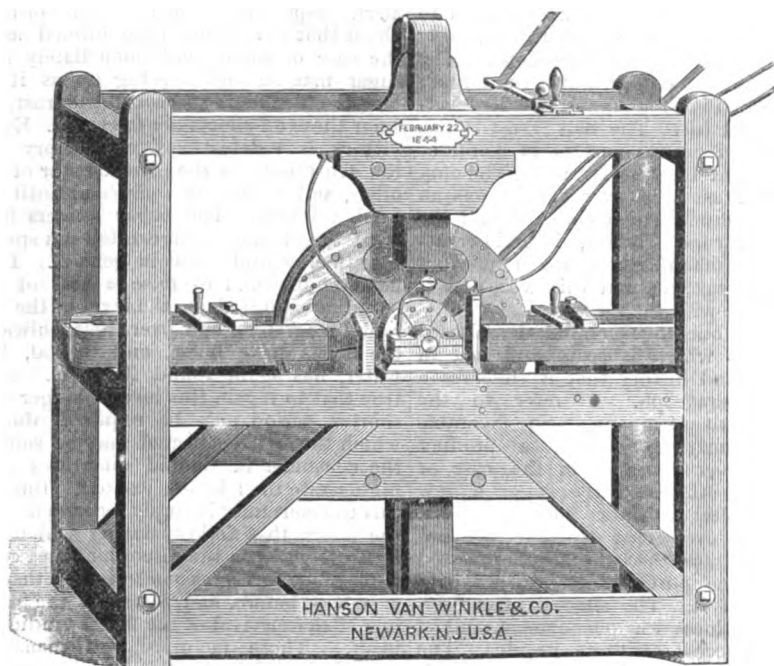
We may exclaim with Macbeth as he watched the shadowy descendants of Banquo filing past, "What, will the line stretch out to the crack of doom?" But as with Banquo's procession, so with trusts, it is comforting to remember that as one approaches another disappears. They come like shadows, and so depart.

The people of America can smile at the efforts of all her railway magnates and of all her manufacturers to defeat the economic laws by trusts or combinations, or pools, or "differentials," or anything of like character. Only let them hold firmly to the doctrine of free competition. Keep the field open. Freedom for all to engage in railroad building when and where capital desires, subject to conditions open to all. Freedom for all to engage in any

brief season indeed, unusual profit upon actual capital invested either in transportation or manufacture, so long as all are free to compete, and this freedom, it may safely be asserted, the American people are not likely to restrict.

Electro-Plating Machines.

An interesting story is told by the two engravings which are placed side by side on this page. That to the left represents the initial step in the employment of electricity for the deposition of metals, while the other illustrates the result obtained by nearly half a century's travel along the path pointed out by the first. The first machine developed a current of electricity obtained from steel magnets—an invention founded upon the great discovery of Faraday—and was perfected and first successfully worked by Prime & Son at their large silver-ware works, Birmingham,



THE FIRST ELECTRO-PLATING MACHINE.



THE LITTLE WONDER.

cerned, but they restricted production. A certain percentage of their machines was kept idle. This percentage was increased from time to time, and only the quantity made that the market would take at a certain price. But the result was that there were soon more machines in America for the manufacture of iron nails added to the works than the demand for nails will require for many years to come, and this combination of nail manufacturers went the way of all trusts, and left the business in a worse plight than it was in before.

The Sugar Trust has already a noted competitor at its heels. The Copper Trust is in danger. All stand prepared to attack a "trust" or "combine" if it proves itself worth attacking; in other words, if it succeeds in raising its profits above the natural level of profits throughout the country it is subject to competition from every quarter, and must finally break down. It is unnecessary to devote much attention to the numerous trusts in minor articles which one reads of, a new one appearing every few days and others passing out of existence, because they are all subject to the great law. The newspapers charge that trusts exist or have existed in wall paper, shoe laces, lumber, coal, coke, brick, screws, rope, glass, school-books,

branch of manufacturing under like conditions.

There can then be no permanent extortion of profit beyond the average return from capital, nor any monopoly, either in transportation or manufacturing. Any attempt to maintain either must end in failure, and failure ultimately disastrous just in proportion to the temporary success of the foolish effort. It is simply ridiculous for a party of men to meet in a room and attempt, by passing resolutions, to change the great laws which govern human affairs in the business world, and this whether they be railway presidents, bankers or manufacturers.

The fashion of trusts has but a short season longer to run, and then some other equally vain device may be expected to appear when the next period of depression arrives; but there is not the slightest danger that serious injury can result to the sound principles of business from any or all of these movements. The only people who have reason to fear trusts are those foolish enough to enter into them. The consumer and the transporter, not the manufacturer and the railway owner, are to reap the harvest.

It is not in the power of man to exact for more than a brief season, and a very

England. The original machine was constructed by Woolrych in 1844, and was the first magnetic machine that ever deposited silver on a practical scale. It is preserved at the works of Prime & Son as a valuable and interesting relic. It is related that Faraday paid a visit with some London friends to the works, purposely to see this application of his discovery in practical operation, and expressed his great delight at witnessing so early and extensive an adaptation of his discovery so favorably carried into practical use. This machine was worked for many years, and was finally superseded by one made by Hanson, Van Winkle & Co., of Newark, N. J. The Woolrych machine stands 5 feet high, is 5 feet long and 2½ feet wide. The manufacturers state that the Little Wonder requires only one-tenth the power needed by the other, and that it will deposit ten times as much metal in a given time. It was designed to meet the demand for an inexpensive, simple and powerful source of electricity for plating. All parts of the machine are accessible, there is no danger of a reversal of current, and with the rheostat or resistance on the machine the current can be regulated so as to plate from a single article to a large tank full of work.

Successful Profit Sharing.

The second year's experience of the Springfield (Mass.) Foundry Company in sharing their profits with their employees shows results much more satisfactory than did the first year. The present dividend was 8 per cent. of the total yearly wages, while the first was 2½ per cent. Regarding the quality of the work executed, there have been fewer poor castings and more better ones. This would appear to overthrow the opinion held by many that it is useless to try to obtain better work by offering the men a portion of the profits, because the conscientious workman will do his best for the firm any way, while the shiftless one cannot be induced by any consideration to alter his methods. It is further argued that, as the shiftless one is certain of obtaining his share of the profits at the end of the year, he really has no inducement to improve, except the satisfaction he would feel at having performed his full duty; and, as he has never been subjected to such a sensation, he is ignorant of its value, and, therefore, not likely to strive for it. If the employer does not adopt profit-sharing for business reasons, he must do it out of pure philanthropy—a qualification not frequently found in relations like these. When he knows he is paying good wages he is not apt to present the recipients of these wages with a portion of his profits in a lump sum at the end of the year.

In the circular issued by the Springfield Company they state that "a noticeable improvement has been manifested in the work and general conduct of our employees during the past 12 months. The average weight of castings has been increased and the proportion of poor work reduced. We have also noticed an increasing interest in the success of the business and a willingness to fulfil every requirement, even though it might be slightly unusual." The company suggested the advisability of the men taking certificates bearing 5 per cent. interest and holding them as a provision against a rainy day, thereby establishing a sort of private sick fund.

A careful account was kept of bad castings, and the loss from this cause was so great that had the castings all been good and marketable "we could better afford to pay you 9 per cent. dividend than we can now to pay 8." The loss on every pound of imperfect casting more than balances the profit on 7 or 8 pounds of perfect castings, this being the case because the margin of profit is so small compared with the whole cost of production. "If our system of profit sharing," they say, "is worth anything at all it must effect more and more reduction in the proportion of imperfect castings every year. This was one of the principal objects of our adoption of the plan, and unless the coming year shows a very material improvement in this regard we shall be obliged to discontinue the sharing of profits altogether. We cannot go before our stockholders and expect them to consent to a division of profits among men who every year lose hundreds of dollars for themselves as well as their employers. And all for lack of care and judgment! We furnish you with the best molding sand we can buy, the hottest of iron, melted from the finest brands of pig to be obtained in the market; our tools, flasks and other appliances are as nearly perfect as they can be made and our foundry is above the average as regards light, convenience and comfort. These conditions do away with almost every reasonable excuse for bad castings and leave scarcely any cause except carelessness, laziness and inattention to your trade. We find no fault with the quality of your good castings. On the contrary, we are

able to say it is first-class, almost without exception. These castings speak for themselves and well merit the excellent reputation they have obtained. They show what you can do. Why not do a little better and have all your work as good?"

Two important changes were made by the company in the rules: only those employed during the whole 12 months will participate in the profits. The second change concerns the molders, who, since they can do much more than any of the others towards reducing the proportion of bad castings, are to receive an extra dividend of 1 per cent. if the reduction should be large enough to warrant it.

The New Watervliet Arsenal.

Chief Engineer Anthony Victorin, United States Ordnance Department, has practically completed the working plan for the new \$700,000 great gun factory at the Watervliet Arsenal, and the contract will soon be ready for letting. The plans involve a radical departure from anything ever attempted in this country. The great gun works of the world, Krupp's, Armstrong's, and Whitworth's, all devote their energies to other branches of metal manufacture, and such appliances as they possess are to a degree designed to be useful for purposes outside of gunmaking, and have been accumulated as demanded by occasion. At Watervliet every piece of the amount of machinery required will be built from special designs by the Chief Engineer.

The factory is to be erected about in the center of the walled-in field of 109 acres constituting the armory reservation, midway between the Delaware and Hudson Railroad in the rear and the Hudson river in front, and contiguous to the Erie Canal, which traverses the lower portions of the grounds at West Troy. A branch railroad will run from the D. and H. main track right through the middle of the shop, across the canal by a new bridge, to the river front, making it available for connection with the three sources of transportation, and including a siding running into the building.

The gun shop will be 983 feet long, with a width of 128 feet on the north wing and 158 feet on the south. Each wing is to be 400 feet long, and between them will be a central structure covering the rest of the room, to hold two 200 horse-power engines—one for service in each wing—office, tool-room, machinery for assembling the guns, and a shrinkage pit 50 feet deep, with three levels, 20, 35 and 50 feet below the ground.

The north wing, which will be finished first, because Congress has not given money enough for the whole, as economy would have dictated, will be formed of a central structure 75 feet wide and 50 feet to the eaves, connecting through arches 12x28, with an annex 25 feet wide on each side running the length, in which the minor mechanism will be stowed.

This north wing is to be utilized for the construction of cannon from 8 to 12 inch bore, the kind now considered most useful by the Ordnance Board. To this end it will accommodate 15 lathes, ranging from 70 to 105 feet in length, all specially constructed. Manufacturers who bid will be expected to follow out the general design, submitting their own improvements. The lathes in the annexes must largely be newly designed for economical handling of the hoops and breech mechanisms.

Overhead will run two 80-ton traveling cranes, and 30-ton cranes will run on suspended tracks in the annexes. The lift of the large cranes will be 35 feet from the floor. The building will be a single story throughout, of a maximum height of 75 feet. It will be of brick and iron, covered with slate. The south wing will contain

a like number of lathes, but will be given over wholly to the manufacture of 16-inch bore breech-loading rifles. Here Mr. Victorin believes an average of 20 can be made in a year, or 25 at a pinch. The same production of 8, 10 and 12 inch guns is allowed for the south wing.

It will take two years to complete the shop for which these plans are now ready—that is, the center and north wing. The south wing could be built as quickly if there was enough money.

Under ordinary circumstances it requires a year to build a big gun, though when this shop is complete the department feels sure that it can be done in nine months. The steel comes to Watervliet from the Bethlehem foundry, rough forged, oil-tempered and annealed. The work of finishing has been going on for a year at Watervliet under adverse circumstances, but with excellent results. In August, 1887, the department sent Mr. Victorin to the arsenal to rig up a gun-shop out of such materials as he could find and set it going. He did it in three months, and, thanks to that move, one 8-inch rifle is now at Sandy Hook, where it has endured over 200 firings and borne every test, while another 8-inch, one 10-inch, and 25 field pieces of 8½-inch bore are almost ready for use. The engineer found at Watervliet two 400-foot sheds of brick built in war time for storehouses. He pulled the ceiling and partition out of one and made a shop of it. Everything in the room is a makeshift, but a pretty good one. The big crane and accompanying derrick were made of a couple of cylindrical posts found at Frankfort Arsenal; the tracks and trusses and crane out of old gun carriages. A shrinkage pit 24 feet deep and 8 inches in diameter was dug out of the rocky floor, an expanding furnace and 60 horse-power engine put in, and in November, 1887, the gun-makers employed went to work, using a 92-foot lathe with 120-inch swing, and a 70-foot with 83-inch swing.

The range of these new 8 and 10 inch rifles is ten miles—equal to that of the best European gun, better than almost anything afloat, and their effective range is eight miles. But the defensive poverty of this country was never more painfully shown than in the fact that it possesses but one carriage fit to accommodate a modern gun. This is holding up the new 8-inch at Sandy Hook. The carriages for the old cast-iron guns are made mostly at the Watertown arsenal. Not one of their patterns will do. A 10-inch gun of Watervliet pattern is 28 feet long, 28½ tons weight, loads with 575-pound shot and 180 pounds of powder; an 8-inch is 24 feet long, weighs 14½ tons, and uses 105 pounds of powder to propel a 280-pound ball. A 16-inch gun should weigh about 50 tons. The charges in all instances are rather heavier than those used abroad. The steel breech-loading field pieces are 7 feet long, 3½ inches bore, use 8½ pounds of powder to a 13½-pound ball, and can hit things three miles off. They weigh but 800 pounds—about one-quarter less than the old brass howitzers. Except for weight of metal carried, these field pieces are about as effective as the old 15-inch columbiads, and can be fired about 25 times as fast. When the big shop is done this impromptu factory will be used for the manufacture of the light field pieces and steel breech-loading siege guns of 5-inch bore and 7-inch howitzers. The old cast-iron cannon are clumsy in comparison with these deadly steel tubes. An 8-inch cast-iron piece, such as grace the harbor forts of New York, carries a 68-pound shot with 28 pounds of powder, with an extreme and uncertain range of four miles, representing a collective energy of 1477 foot pounds, against 6880 developed by its steel rival.

Radial Drilling Machine.

This drill, in which several new and important features appear, is manufactured by the Putnam Machine Company, of Fitchburg, Mass. The machine has a combination of the two standard systems of driving-belt and gear. The cone has four changes, and the idle pulleys are mounted on eccentrics in such a way that the belt may be tightened without stopping the machine. The back gearing, instead of being at the cone pulley, is placed on the arm, this arrangement not only reducing the parts, but also saving power, as the moving parts and bearings are reduced. The head is moved by a rack and pinion gear, and can be firmly held to the arm at any desired point by means of a friction-clamp operated by a lever. Under the collar of the vertical lifting screw is a ball

must be completed within eight months, but where they are to be built is not yet known. The largest of the guns are 15-inch caliber and the extreme range of fire is one mile. The bid of the gun company was \$395,500.

The Coke Wages.

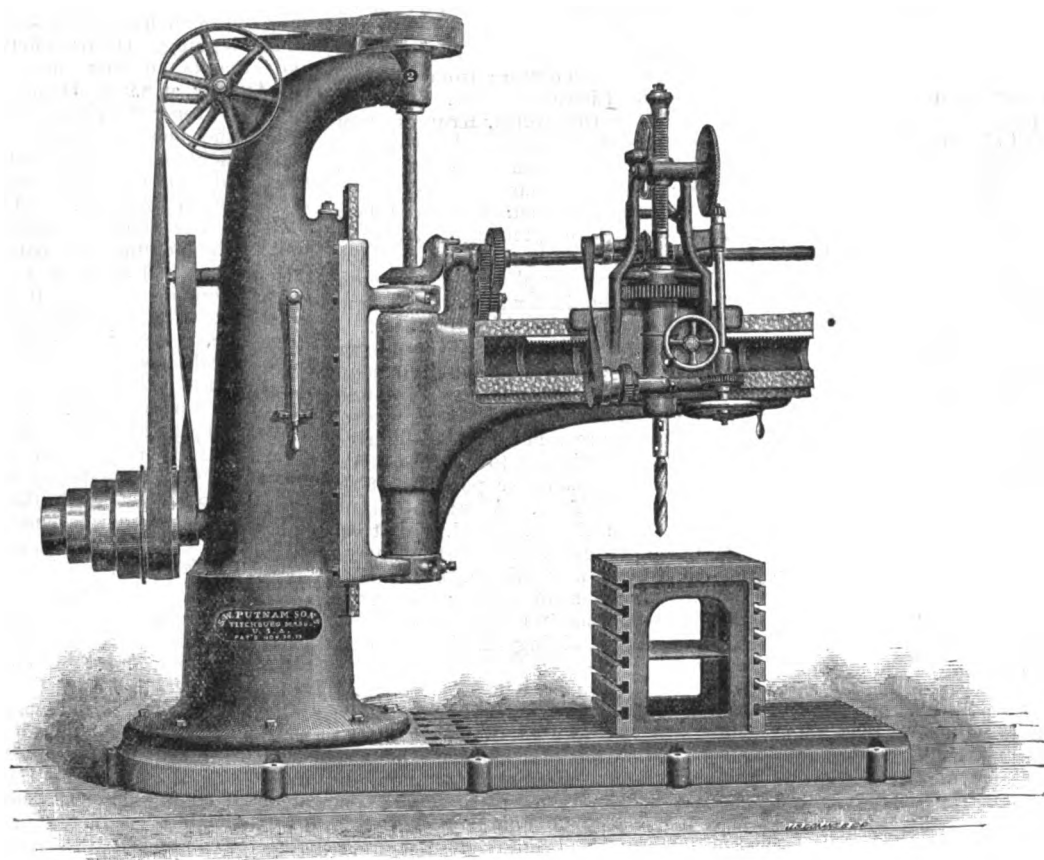
As we predicted in *The Iron Age* of last week, the threatened coke strike in the Connellsville region has not taken place, and, with one or two exceptions, all the works in the region are in operation. In addition to this, we report that the H. C. Frick Company have signed the scale, the same it has been paying for over a year, which is 6½ per cent. higher than the wages paid at the other works in the region. It is to remain in force until January 1, 1890, but contains a provision

Furnace coke, \$1.25; to dealers, \$1.35; foundry coke, \$1.50; crushed coke, \$2.20; all on board cars at ovens, per ton of 2000 pounds.

Competition of Prison Labor.

The competition of prison labor is a subject treated very cleverly by one of our contemporaries, who endeavors to dispel from the minds of labor organizations the delusion that free labor is injured by the labor of convicts under any proper management. The writer says:

Suppose the 3000 able-bodied men in the prisons of the State were distributed among various productive occupations as industrious and law-abiding citizens. Who would suffer by it? Their production would support themselves, and perhaps help to support others.



RADIAL DRILLING MACHINE, MANUFACTURED BY THE PUTNAM MACHINE CO., FITCHBURG, MASS.

thrust bearing. In the machine illustrated the distance from the face of the column to the end of the arm is 6 feet 2½ inches. The arm has a vertical traverse of 36 inches, and the drilling head has a radial traverse on the arm of 42 inches. The spindle has a range of 16 inches, is counter-balanced and has a quick return by rack and pinion, which is always in gear; it also has hand and automatic feeds of six changes—three for drilling and three for boring. The portable drilling table is accurately planed on all sides; has T slots on top and sides, and is formed with a vertical V groove for holding square or cylindrical work. The base plate is 9 feet 8 inches long, 44 inches wide and 6½ inches thick; it has anchor holes for foundation bolts, T slots, guide hole for boring bars, and is planed on top and bottom.

The Secretary of War has awarded contracts for seven dynamite guns of the pneumatic pattern, similar in construction to that recently tested at Fort Lafayette; three of them to be located at Sandy Hook, two at Fort Schuyler and two at Fort Warren, Boston harbor. The guns

which will permit that concern to revoke the scale on March 15 next unless a uniform scale is adopted throughout the region. There has been no improvement in the demand for coke, and but few works in the region are being operated full time. Four days in the week seems to be the rule. In view of this, it is safe to say there will be no advance in prices for some time, and a slight reduction in the near future is not improbable. There are 77 coke plants in the Connellsville region, and the week ending on February 2 showed 12,551 ovens in operation, 710 idle and 720 in process of erection. The production for that week was estimated at 103,233 tons. During the previous week there were 12,626 ovens in operation, and they turned out 110,958 tons of coke. The shipments for the week before last aggregated 5600 cars, consigned as follows: To Pittsburgh and river points, 1400 cars; to points west of Pittsburgh, 3100 cars; to points east of Connellsville, 1100 cars. The figures for the previous week were: Pittsburgh, 1550; West, 3250; East, 1150; total, 5950. The prices ruling at present are as follows:

Would it be an advantage to the rest to sequester these 3000 men from labor and support them in idleness? If so, why not 10,000 or 100,000? If it would not be an advantage, supposing them to be free men, why is it an advantage when they are sequestered within prison walls for crime? If it would be better for all concerned that they should work and earn their own living if they were at large in the community, why is it not better that they should do so in prison? As a financial matter for the State, of course, it is best that convicts should be self-supporting. As a matter of health and discipline, of physical and moral improvement for themselves, it is admitted to be better that they should be employed in productive industries. As an economic matter for the community, including all workingmen, it is equally an advantage. There is no possible gain in setting apart a percentage of the able-bodied population to be supported in idleness by the rest.

A \$500,000 fire-proof building will be erected in Newark, N. J., by the Prudential Life Insurance Company.

The "Perfect" Radiator Valve.

A radiator valve designed to overcome the common objections of leaky stems, by which carpets and ceilings are often damaged and other considerable injury occasioned, has just been put upon the market by Curtis & Co., 140 Centre street, New York. In Fig. 1 a general view of the Perfect radiator valve is shown, while its internal construction is illustrated in Fig. 2. The special feature of this valve is that it is made without stuffing box, packing or ground joints, the metal diaphragm shown in Fig. 2 taking the place of those and preventing the leakage of water. The diaphragm is made of phosphor-bronze, which, as is well known, is a very strong and durable alloy. By the use of this diaphragm and by means of the lever-arm arrangement, a slight movement is sufficient to open the valve. The valve shuts off with a pres-

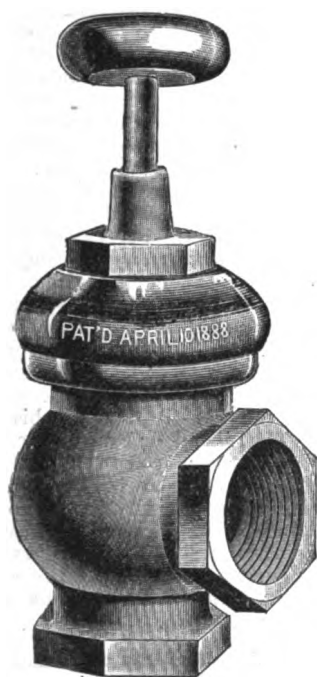


Fig. 1.—General View of Valve.

The Farm Value of Crops.

The aggregate value to producers of the five principal cereal crops at the average farm prices, as ascertained by the Agricultural Department, for the two years has compared as follows:

	1888.	1887.
Corn.....	\$677,000,000	\$646,000,000
Wheat.....	385,000,000	310,000,000
Oats.....	195,000,000	200,000,000
Rye.....	14,000,000	13,000,000
Barley.....	33,000,000	29,000,000
Total.....	\$1,304,000,000	\$1,198,000,000

Here is an increase of more than \$100,000,000 in the amount realized by farmers from the sale of their cereals. The abund-

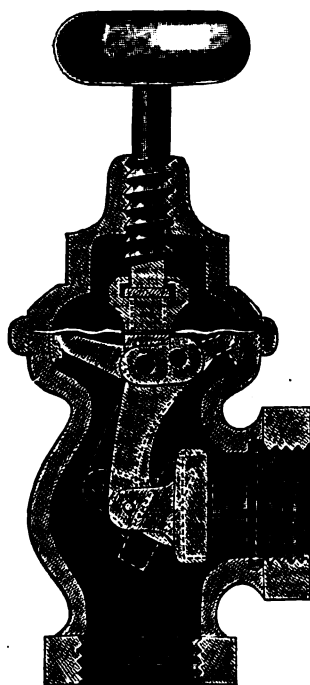


Fig. 2.—Sectional View.

THE "PERFECT" RADIATOR VALVE.

sure behind it, making it absolutely tight at the seat. It is stated that a test of two years has established the reliability of this device, and has proven the fact that it will not leak. The manufacturers further state that the valves open and close easily. The Perfect radiator valve is made in ten different styles, of $\frac{1}{4}$, 1, $1\frac{1}{2}$, and 1 $\frac{1}{2}$ inch size.

G. W. Hunt, one of the principal contractors and railroad builders of the Pacific Coast, has been spending some time in Chicago recently, arranging for future operations. He is now completing the Seattle, Lake Shore and Eastern Railroad, with his headquarters at Walla Walla. D. C. Black, formerly with the Morden Troy and Crossing Company, of Chicago, is now acting as Mr. Hunt's secretary, and accompanies him on his Eastern tour.

The New Jersey Central is to have a new steamer for the accommodation of the Sandy Hook business during the coming season, to be named the Sandy Hook. This steamer will be 270 feet in length and 48 feet in width, with a draft of 9 feet forward and 10 feet aft. She is to be a

ant hay crop adds to the favorable character of this showing.

Extending the comparison for the two years to other important classes of production, the potato crop forms an important item. For 1888 the yield has been nearly 200,000,000 bushels, as compared with 134,000,000 bushels in 1887; but the average farm price, as reported by the Department of Agriculture, is 40 as compared with 68 cents per bushel, and this fall in price decreases the aggregate value of the crop to producers to about \$80,000,000, as compared with more than \$90,000,000 for 1887. In other vegetables and fruits the yield has been abundant and the prices lower, the greater yield and lower price probably leaving little difference between the aggregate value of the crops of the two years. The meat supplies also have been very large, and the price at first hands somewhat reduced. The Agricultural Department estimates the wool clip at 269,000,000 pounds for 1888, compared with 333,000,000 for 1887. The cotton crop, according to latest indications, is likely to differ but little from that of 1887 in aggregate value to growers. There is no means of extending the comparison to

all these items with the approximate accuracy attainable in reference to the cereals, but there is ample evidence that the aggregate value of all the products of the farms for 1888, as realized by the producers, has been very materially greater than for 1887, and that to this extent the present situation is better than a year ago, and the agricultural interests more prosperous. The effects of such an improvement necessarily extend to every class of the community.

The Carload Lot Cases.

There is reason to believe that the so-called carload lot cases will be decided by the Interstate Commerce Commission very soon. As the matter stands, the plea of the complainants is virtually covered by the following brief statement:

We complain especially and particularly of an unjust discrimination in freight charges as between carloads and less than carloads, on the following specific articles: Coffee, cider, sugar, paint, liquors, prunes, crockery, salt and pickled fish, canned goods, soda and saleratus, pickles, salt and molasses, and generally of the unjust discrimination by means of carload rates on any sort of freight where the normal unit of shipment is the commercial package. If the theory, urged *pro re nata* by the railways, that the amount of difference in the tariffs for different quantities of these specific articles can be justified and should be determined by the actual difference in the cost of transportation, be accepted by the commission, then it is of uttermost and essential importance to the public who pay the charges that the actual difference in each particular case can be accurately and precisely ascertained before the theory be applied to the tariff. It is our contention, therefore, that inasmuch as the burden of proof is upon the railroads to justify these differences for quantity in freight rates, they should be held strictly to the issue, and should be required either to furnish definite information upon the alleged great difference in the cost of transportation—which they confess and everybody knows to be impossible—or to defend their rates upon some other theory, and the respondents have had nearly a year since the complaints were filed to ascertain the facts.

The defendant railroad companies, in reply to this, allege that the difference in cost of transportation of large and small shipments justifies the discrimination in rates. This assertion is supported by general arguments, but without detailed exhibits of actual cost of service in the various classes of which complaint is made.

The Senate Committee on Claims last week heard a delegation of iron mill men in support of a bill now pending in both Houses of Congress. The bill proposes to repay the importers of steels, chiefly in the Allegheny and Mahoning Valley districts the difference between a duty of 45 per cent., which was collected, and one of 35 per cent., which they claim a decision of the Supreme Court holds to be the correct duty. The amount involved is about \$600,000. W. S. Groome, of the firm of J. F. Bailey & Co., New York; R. F. Downing and H. E. Collins, of Pittsburgh, addressed the committee. They were unable, however, not being lawyers, to cite the Supreme Court decision upon which they rest their claim, and a postponement was had in order to enable them to present it to the committee.

The New York, Susquehanna and Western Railroad will extend its coal shipping facilities, and, as a step in this direction, it has begun the erection near Two Bridges Station, N. J., of a large system of coal shutes, covered by a building 1000 feet long and having a storage capacity of 200,000 tons. Two Bridges is 63 miles from New York.

The contract for constructing a dry dock at the Philadelphia Navy Yard was awarded to J. F. Simpson & Co. at their bid of \$548,700.

THE WEEK.

The navigation of the Hudson River at Newburg was closed by ice on Thursday, February 7, and ice began to obstruct the bays on rivers on Long Island Sound, for the first time this season.

The Dock Board have authorized their chief engineer to remove all vestiges of the site of West Washington Market by moving back the shore line 200 feet, and extending two piers 620 feet into the river for the accommodation of ocean steamers. The docks rent at from \$25,000 to \$45,000 per annum.

Ex-Consul Sewall, of Samoa, contends for a vigorous policy, representing that the seizure and deposition of Malietoa was in pursuance of a deliberate plan on the part of Germany to obtain control of Samoa; that this step is only the precursor of measures to secure foreign supremacy in the Hawaiian Islands, Lord Salisbury being a party to the scheme, and that no protest from the United States will turn Germany from the course it is steadily pursuing.

After spirited discussion, the Nicaragua Canal bill passed the House with unexpected unanimity, the vote standing 177 to 60. The event was signalized by a burst of applause unusual in that body, warranting the inference that the Panama Canal failure, together with events in Samoa, have assisted very much in removing objections to the bill and have invested the subject with a new interest. The bill as passed contains every provision which the promoters of the enterprise desired. The United States is not committed to any pecuniary liability on account of the company, but it requires the company to make a yearly report, giving such detailed statement of their affairs and of their assets and liabilities as may be required by the Secretary of the Interior. This provision, in connection with the reservation by Congress of the right to amend the act at any time, gives the company the benefit of the moral support of the United States in all their legitimate undertakings. The Senate agreed to the conference report, and the bill now goes to the President for his approval.

It is computed that the car-drivers' strike in this city cost \$1,700,000, of which \$1,500,000 was sustained by the retail trade. The loss of the car companies is put down at \$117,000 and the strikers about \$50,000.

A false report that a car-building firm in Detroit had received a large order was followed by a "deluge of letters" from iron firms and supply companies desirous of bidding for the work, which fact was construed as an indication of general dullness and low prices in the iron trade.

A feature in the enlarged Philadelphia Mint, for which Congress appropriated \$200,000, will be a marble tower 40 feet square.

A large freight and transfer station, probably the largest in America, will be erected in the environs of Pittsburgh for a syndicate representing railroads on either side of the Ohio river, and by means of a bridge secure uninterrupted transportation. Another great union depot is to be built at Pueblo, in Colorado, for the Missouri Pacific, Rio Grande and other companies. The structure will be of red sandstone and cost about \$250,000.

The oil producers of Pennsylvania are encumbered with an accumulation of 3,500,000 barrels of the crude article, which they expect to sell eventually for nothing less than \$1 per barrel.

The Hudson Street Electric Railway, to extend across the city from the Fulton

ferry to the Cortlandt street ferry, is expected to be in operation May 1, the right of way on the west side having been secured, and all the requisite materials are contracted for. It will run 20 cars.

The American Institute is losing money, as the result of its annual exhibitions in this city. At the annual meeting of the trustees in this city last week the surplus in the treasury was nearly \$15,000, but a member of the board stated that expenditures during the last five years had exceeded the receipts to the extent of \$35,000, and that in five years more the surplus will be exhausted.

American stoves are so far superior to those in common use in large parts of Europe that manufacturers here might reasonably expect to find markets abroad sufficiently ample to absorb all their possible surplus. But a difficulty exists in the inferior coal consumed on the Continent. Not long ago a Pittsburgh manufacturer shipped a lot of stoves to Germany, and being informed that they failed to give satisfaction learned after investigation that the coal used produced many clinkers and slag. The better grades of coal were too expensive for general consumption. A variety of artificial substitutes can be had, but as a rule economy is consulted rather than comfort.

The proposal of the United States Government, through Secretary Bayard, to bring about international co-operation for the reduction or abolition of tonnage dues on shipping has resulted in complete failure, excepting as information may have been gathered for the guidance of the incoming administration. The replies received to overtures in furtherance of the general object show a disinclination to entertain the proposal, mainly for the reason that the "favored nation" clause of existing treaties would prevent the abolishment of all charges in the case of the ships in one country and not of those in another. Several countries have no merchant marine in the foreign trade, and consequently there could be no reciprocity.

The proposed railroad to parallel that of the New York and New Haven Company would afford an acceptable addition to traffic facilities, however much it may be opposed by certain special interests. Some of its advocates are directors in the New York and New England Company.

Yellow fever is making progress in Brazil, and the open winter on our Atlantic Coast affords a reasonable admonition that the disease may extend northward during the approaching summer.

The Alaska Commercial Company have paid into the United States Treasury since the "Seward purchase" was completed \$8,000,000. Russia received for the whole country \$7,200,000.

The price of American wheat being materially affected at times by the crop in India gives interest to facts concerning the agricultural progress of India. Efforts which are making through an agricultural department established at Bengal to improve the quality of wheat indicate the probability of increasing competition from that quarter. In 1872 India rose to the second place as a feeder of Great Britain, and in 1877 the relative positions as concerns the United States were maintained, but trade returns for 1888 show a startling revolution in the figures. Russia has taken first place, sending 21,896,000 cwts. as against 5,523,000 cwts. during 1887, this increase being almost entirely at the expense of America, the falling off in the imports from the United States amounting to 15,857,000 cwts., while India has exported within 825,000 cwts. of the preceding year; and it is worth noting, as pointed out by Sir James Caird in the London

Times, that this change of basis in supply has been accomplished without in any material degree advancing the price of bread in England.

English manufacturers complain that the exceedingly low wages of German operatives make competition almost impossible. The North British *Mail* says: "Among the operatives in Saxony weekly wages have fallen in a most marvelous manner—indeed, it appears that while the better-class operatives in the mills are obtaining 10 marks per week for their labor, others devoted to the less skillful operations are actually not receiving more than about 5½ marks per week. It is almost impossible to conceive that this state of things can get any worse."

In Japan, as in China, events are impending which must give shape to the future policy of those empires and have a direct bearing upon their relations with other Governments. While it is probable that the recent progressive tendencies of China have already provoked reaction, as evinced in the recent hostility to foreign influence, the Mikado of Japan is leading off in the direction of more radical innovations. Seven years ago, in response to popular petition, he resolved to call a National Assembly in 1890 for the purpose of organizing a constitutional government. In accordance with this purpose the draft of a constitution was prepared and recently was submitted to the Privy Council, consisting of 20 members, besides eight Ministers of State as ex-officio members. Five princes of the royal family and seven other members, representing the people, but appointed by the Mikado, made up this council, of which Ex-Prime Minister Ito was chairman. The Mikado assumed to establish the constitution by his own power. The Liberal, or Progressive, party was in favor of leaving it to the Assembly, while the Government party, composed chiefly of nobles, opposed this. The latest information is that despite all obstacles the constitution was promulgated last Monday, inaugurating a new era in the empire. Count Ito will be entitled to rank as the Washington of Japan.

A dynamite bomb, placed under the north foundation wall of the malthouse of Daniel Stevenson's boycotted ale and porter brewery, at the corner of Tenth avenue and Fortieth street, by some unknown miscreant, exploded with terrific force on Friday afternoon. The solid rock on which the malthouse is built was torn up to the depth of 30 inches, and a hole was blown into the 24-inch foundation wall. For 200 feet in a northeasterly direction every house was more or less injured by the concussion.

The Pacific Guano Company, of Boston, capital \$1,000,000, made an assignment to John C. Ropes. It had extensive facilities in South Carolina and at Wood's Holl, Mass. Glidden & Curtis, the company's selling agents in Boston, were carried down in the crash. John M. Glidden is president of the Ohio and Western Coal and Iron Company.

The freight rates on iron articles from Pittsburgh to all points between St. Paul, Minneapolis and Minnesota Transfer were advanced last week from 2 to 3 cents per 100 pounds. White lead and paints were also advanced about the same.

It is reported that contracts have been closed between a large ore company in Cleveland and the Northern Steamship Company, owned by President Hill, of the Manitoba Railroad Company, for the transportation of ore freights for the next season from the head of Lake Superior to Lake Erie ports at \$1.25 a ton.

MANUFACTURING.

Iron and Steel.

The report that the plant of the Elba Iron and Bolt Company, Limited, at Pittsburgh, recently started up under lease by Henry Darlington, of that city, had closed down for an indefinite period is without foundation. The works are being operated full time in all departments.

By direction of Manager Wick the plant of the Warren Steel and Iron Company, at Warren, Ohio, was closed down last week for an indefinite period. The management recently received an offer to remove the works to Girard, but whether this caused the shut-down or not is not known.

It is announced that the plant of the Cartwright Iron and Steel Company, formerly known as the Alikanna Rolling Mills, at Steubenville, Ohio, is being extensively improved and will shortly be put in operation. The product will be taken by the National Tube Works Company, of McKeesport, Pa.

Application has been made for a charter for the Duquesne Forge Company, of Pittsburgh. The company is composed of R. S. Smith, Alex. McKim, John Bissell and others, who have purchased the plant and interests of the Miller Forge Company, Limited, located at Rankin Station on the Baltimore and Ohio Railroad, about 10 miles from Pittsburgh. Plans are being prepared for some extensive improvements. New machinery will be put in and some new buildings will be erected so as to nearly double the present capacity of the works.

Fred Bishop has resigned his position as superintendent of the plant of the Warren Iron and Steel Company, at Warren, Ohio.

The plant of the Virginia Nail and Iron Works Company, of Lynchburg, Va., is situated about 8½ miles above Lynchburg, on the Richmond and Allegheny Railroad. The works consist of a blast furnace, 65 x 12 feet, equipped with two iron-pipe stoves; Weimer engine, three cylinders, 48 x 36 inches, driven by water-power; a rolling mill, 20-inch muck train, 18-inch plate train and 10-inch bar and guide train, seven double puddling furnaces and one M. V. Smith gas heating furnace, and a nail factory with 46 machines. The metal is run from the blast furnace into large ladles mounted on cars, which are run over tracks, turn-tables, &c., to the puddling furnaces, and poured by tipping into the furnaces. The ladles are controlled by worm-wheels, on which are marks to regulate the charge. About 40 minutes are saved in making a heat over the time required to melt the pig iron and make it. Having water-power, the gas not needed for the stoves is piped over to the Smith furnace, and the company can heat for both the plate and the bar trains. The ores come from above and below the works along the river, limestone from Indian Rock, on the R. & A., and coke from either the Norfolk and Western Flat coal-field or the Chesapeake and Ohio New River region. The arrangements for the molten metal and the gas for reheating are of the simplest kind. The ladles are run down an incline by the side of the blast furnaces so that the metal can be run into them. The gas is conveyed in an 18-inch plate-iron pipe from the down-comer into the mill, which is just below the blast furnace.

Morris P. Canfield and Robert A. McKean, of Pittsburgh, having secured the title and good-will of the Pittsburgh Construction Company, have associated themselves together under the name of the Pittsburgh Construction Company, for

the purpose of carrying on the constructing and engineering business in all its branches. They have also been granted license by M. V. Smith to construct the Smith regenerative gas furnace and producers. The new firm are located in the Hamilton Building, in the above-named city.

On January 1 of this year the Steel Car-Wheel Company of Boston started a small Bessemer plant, which was built for them last year by James P. Witherow, of Pittsburgh. The plant consists of a 3-ton tilting converter. The product will be a metal patented by the company, and will be chiefly used in making car-wheels. The works of the company are at the corner of First and I streets, Boston.

Work has been commenced on the erection of the new plant of the Union Steel and Iron Company at St. Joseph, Mo., and it is expected to be ready for operations by May next. M. V. Smith, of Pittsburgh, is consulting engineer for the company.

The Green Nail Works, at Tiffin, Ohio, were totally destroyed by fire on the morning of the 6th inst. The loss is estimated at \$50,000, with no insurance. The plant had but recently commenced operations.

A company to be known as the Dickson Car-Wheel Company have been incorporated to manufacture car-wheels at Houston, Tex.

The Standard Rolling Mill, at Minneapolis, Minn., has been torn down. It was idle in 1887 and 1888. Its annual capacity was 1200 net tons of bar iron. The only other rolling mill in the State, the Capital Iron Works, at St. Paul, was also idle in 1888.

On account of a lack of orders, the rolling mill of the Kittanning Iron Company, Limited, at Kittanning, Pa., has closed down for an indefinite period. The firm manufacture muck iron principally, which is consigned to Pittsburgh. The blast furnace of the company continues in operation.

R. Heckscher & Sons' Swede Furnace, at Bridgeport, Pa., of which Alfred Walters is superintendent, has eclipsed its former records by making 604 tons of pig iron last week.

The Scranton Steel Company, at Scranton, Pa., rolled 252 rails, 56 pounds to the yard, in one hour. So far as is known this beats the record for rolling in that length of time considerably. With heavier rails, of course, the tonnage, too, would have been exceptional.

Park Brothers & Co., of Pittsburgh, have recently completed an additional large open hearth steel furnace.

The Etowah furnace, at Gadsden, Ala., we are advised by Rogers, Brown & Co., made 850 tons in the seven days ending February 5, and is now averaging close to 130 tons per day, 85 per cent. of which is foundry grades. John Dowling, for many years at Rising Fawn, the best known furnaceman in the South, is superintendent. Col. R. B. Kyle, of Gadsden, is president.

A rumor is in circulation that the Joliet Steel Company have notified their men of a 12 per cent. reduction. The management deny this, and state that not a word has been said in regard to a reduction of wages. The mill closed on the 9th inst. for three weeks for repairs, as is usual once a year. During the shut-down the management will consider with the employees the question of adopting the sliding scale, or a rate of wages based on the price of rails—rising as rails rise and lowering in like proportion with the falling in the price of rails.

The Midvale Steel Company, of Philadelphia, Pa., have been awarded the con-

tract for furnishing all the tires to be used on the New York Central and Hudson River Railroad and the West Shore Railroad during the year 1889.

The rail mill of the Cleveland Rolling Mill Company, at Cleveland, Ohio, has been started up, the men accepting a reduction of wages.

On Saturday, the 9th inst., notices were posted on every furnace in the Mahoning Valley, Ohio, notifying the employees of a 10 per cent. reduction in wages, to take effect on March 1, next. An advance of 10 per cent. was made last November, but the furnacemen claim that the present prices of pig iron will not justify them in paying it at present. It is thought the men will agree to accept the reduction.

The Brooke Iron Company, at Birdsboro', Pa., on Saturday gave notice of a reduction in puddlers' wages of 25 cents per ton, from \$3.25 to \$3. The mills at Pottstown and other places recently made similar reductions.

The Bethlehem Iron Company, of Bethlehem, Pa., have called a general meeting of the stockholders on Tuesday, February 19th, at 12 o'clock noon, for the purpose of making and adopting by-laws. On the same day there will also be a special meeting of the stockholders for the purpose of voting for or against an increase of the capital stock from \$2,000,000 to \$3,000,000, or to such amount not exceeding \$3,000,000 as may be approved at said meeting.

About 100 men in the Bessemer department of the Otis Iron and Steel Company, Cleveland, have been laid off on account of a falling off in orders.

The new plant of the Muncie Nail Company, at Muncie, Ind., is nearly completed, and all departments are expected to be at work before the 1st of March. The product will be merchant bar, steel nails and muck iron. They have 16 puddling furnaces, four heating furnaces and capacious annealing furnace. Their machinery includes a 20-inch train of rolls, a plate train, muck train and 50 nail machines. They also have a complete foundry for iron and brass castings, and a cooper shop for the manufacture of kegs, use natural gas throughout the mill, and will employ about 200 hands.

Edwin Mickley, superintendent of the mining interests of the Thomas Iron Company, of Hokendauqua, Pa., for the past 32 years, has resigned his position, to take effect on March 1, next.

The Lewis Foundry and Machine Company, Limited, Pittsburgh, have the contract in hand for a new rolling mill to be located at Rome, Ga. The same company have just shipped to Anderson, Ind., the machinery for a Garrett rod mill, with all of the latest improvements made by Mr. Garrett.

For the five weeks ending on February 2 the two stacks of the Isabella Furnace Company, at Etna, Pa., produced 15,526 gross tons of pig iron.

Hanson, Van Winkle & Co., of Newark, N. J., the first to introduce in this country dynamo-electric machines for depositing metals, have published a large catalogue of their electro-plating and polishing material and machinery. They fittingly introduce their catalogue with an illustrated description of the Woolrych electro-plating machine built in 1844, and then show the improvements found in the machines of to-day. After fully describing their products they close with an extended list of users of their machines and materials.

Machinery.

The Milton Mfg. Company are refitting their rolling mill at Milton, Pa., and are putting in nut and washer ma-

chinery. Heretofore they have made only bar and hoop iron. The company were reorganized in 1888, and now consist of S. J. Shimer, president; E. S. Shimer, secretary and treasurer, and G. S. Shimer, superintendent.

L. D. Pollard has been succeeded by Hoskins & Shepardson in the manufacture of engines, boilers, iron and wood working machinery, special saw-mill machinery, &c., at 14-18 South Canal street, Chicago. The new firm is composed of E. J. Hoskins and D. A. Shepardson. The establishment is of long standing, having been founded in 1868.

A. B. Bowman, St. Louis, Mo., reports his January business as being considerably more than January of 1888, and, judging from the number of orders already received, this month will well stand a comparison with the corresponding month of last year. His sales include engines, boilers, planers, lathes, &c. He has also one or two large lots which are under negotiation, but which he expects to close in a few days.

Shultz Belting Company, St. Louis, report an active state of affairs so far as they are concerned, and say they have no reason to complain for want of business. They have lately received a number of large orders from the South and Southwest.

W. P. Davis Foundry and Machine Tool Works, of North Bloomfield, N. Y., has opened a salesroom and office at 169 Mill street, Rochester, for the sale of machine tools, engines and boilers. This will facilitate the making of quick shipments by various routes. The North Bloomfield works will be run as usual; now they are run on full time and with a full force of men. In a short time Mr. Davis will bring out a large key-seating machine entirely new in design and well suited for large machine shops.

The Skinner Chuck Company, New Britain, Conn., have increased their capital stock from \$12,000 to \$36,000. The additional capital was called for by an increase in the business, which has been established less than two years. The company advise us that they are at present behind their orders, but with the increased facilities now being obtained hope to be able to meet the demand promptly.

Gould & Eberhardt, the tool builders, of Newark, N. J., write us as follows: We report recent shipment of Eberhardt's patent automatic gear cutters and drill presses to the noted tool shops at Koping, Sweden, and also to Kharkoff, Russia. This we take as an indication of the increasing favor with which the better class of American tools are looked upon in foreign countries.

We have received an inquiry from Wm. E. Peck, 17 Cedar street, New York, as to where to buy machinery for the manufacture of buttons of all kinds.

We have received a communication from Robertson, Lloyd & Co., of Durham, N. C., in which they state that they want a "shop machine for cutting threads further back on the axle" than usual. "In this section, where sand is so abundant, the boxes of wheels are very soon so badly cut that washers will not stop wheels from rattling, and the idea is to cut the threads of spindle further back."

The Goulds Mfg. Company, of Seneca Falls, N. Y., wish to communicate with manufacturers of noiseless gears.

Hardware.

About two weeks ago the employees of the wire department of the Braddock Wire Company, at Rankin Station, Pa.,

were notified of a reduction of 17 per cent. in wages. A meeting of the employees was called at once, at which it was decided to resist the reduction, with the result that that department was idle for several days. The matter was finally compromised by the firm withdrawing the original demand and proposing a reduction of 8 per cent., which was agreed to by the workmen, and operations were again resumed. The reduction does not affect the employees of the roll department.

The W. G. Avery Mfg. Company, Cleveland, Ohio, have recently increased their facilities for turning out their hardware specialties, and hope to be able to fill orders promptly.

During the past year Malin & Co., Cleveland, Ohio, moved into new quarters and built machinery which doubled their capacity, so that they are now in a position to meet the enlarged demand for their goods. The full capacity of the shop, they advise us, is 2000 feet of wire per minute, or over 3,000,000 spools a year. In addition to their manufacture of wire they are making arrangements for the manufacture of other patented wire specialties which they expect before long to put on the market.

At a recent meeting of the stockholders of the Bryden Horse Shoe Company, of Catasauqua, Pa., the following Board of Directors was elected to serve for the ensuing year; David Lydig, New York; Justice Cox, Jr., Philadelphia; Charles K. Barns, Philadelphia; J. W. Fuller, Catasauqua; W. P. Hopkins, Catasauqua. At a meeting of the directors held subsequently Charles K. Barns was elected president, Oliver Williams, treasurer and secretary, and T. F. Fredericks superintendent.

Miscellaneous.

The Perry Stove Company, Nathan B. Perry, president, and John T. Perry, secretary and treasurer, announce that they have purchased from the firm of Perry & Co., of Albany, their foundry property on Van Rensselaer Island, and their machinery, equipment and the good-will. They will continue to manufacture the Argand stoves and ranges.

The Clearfield Coal Company, Tylers, Clearfield County, Pa., have just started their new washing plant. About a year ago their old plant burned down. The company decided to build again on a much larger scale, increasing the number of coke ovens from 80 to 100, with a new set of the Stutz crushing and washing machinery, having a capacity of 800 to 400 tons daily. S. Stutz, who also built the old plant in 1882, has since made many improvements. The coal makes a fine coke, which finds a ready market. A. K. Jacobs, C. E., is superintendent, and has charge of the works.

The Duty on Steel Rail Crop Ends.

Assistant Secretary Maynard has informed a firm of New York importers that the question recently decided in the Supreme Court in the case of Robertson against Perkins, was simply to the effect that as steel was a metal specified in the tariff acts, steel rail crop ends cannot be classified under the provision for "metal unwrought not specially enumerated or provided for." The question as to whether such ends or pieces of steel rails are dutiable as "steel not specially enumerated or provided for," or as "scrap steel," was not, he says, presented in that case, but was covered by a previous decision of the Court in the Schlesinger case. This decision, he says, is the basis of Department's ruling of February 14, 1887, that such merchandise having been in actual use in making the rails, is dutiable under the provisions for "scrap

steel." The Department therefore declines to apply the decision in the Perkins case to certain steel rail crop ends heretofore imported.

Ore Roasting at Lebanon.

C. W. Davis, Jr., when connected with the Katahdin Charcoal Furnace, in Maine, was forced by the necessity of making a chilling iron from ores high in sulphur to make a long and exhaustive study of the question of thoroughly roasting iron ore. Starting with the Westman kiln, the Davis-Colby kiln was finally developed. This has lately been put up at the Colebrook furnaces of Robert H. Coleman, at Lebanon, Pa., where one of the 24 Giers kilns was remodeled. Mr. Davis introduced some modifications in the design of the kiln as built at Katahdin, the principal features of novelty being that the furnace gas is introduced in two zones, one below the other, each, of course, having its own supply of air for combustion. The ore is charged in an annular space left between the lined shell and the center flue, which is carried up and into a draft stack. This facilitates the charging of the ore. At the Colebrook furnaces the furnace gas was taken from the down-comer at a point before it enters the hot-blast stoves, by a 15-inch pipe, which is carried over the stock-house to the kiln, a distance of about 250 feet. A slide valve in the pipe was open only to the extent of leaving a 5-inch sector, the quantity of gas thus available being, it is reported, sufficient to roast about 75 tons daily, after the kiln had been heated through thoroughly. We understand that the roasted ore carried about 0.5 per cent of sulphur. We understand that five more kilns have been ordered, and that, besides, three large kilns, 20 feet in diameter and 20 feet high, are to be built at Cornwall.

The Ohio and Western Coal and Iron Company filed an assignment in this city on Monday to James A. Hall, without preference. The deed of assignment conveys to the assignee all the lands, furnaces, buildings and appurtenances of the company, subject to a mortgage to the Boston Safe Deposit and Trust Company. The deed is signed by Chester Griswold, vice-president, and George C. Thomas, secretary. The president, John M. Glidden, was of the firm of Glidden & Curtis, of Boston, who failed last week, and their failure precipitated the assignment of the company. According to *Bradstreet's* reports the Ohio and Western Coal and Iron Company is a reorganization of the Standard Coal and Iron Company, which was sold out under foreclosure in 1883, and was bid in by D. N. Stanton, Thomas T. Mason and George Chapman, who held it as trustees pending the organization of the Ohio and Western Coal and Iron Company. This company was incorporated under New York State laws, October 25, 1883, with a capital stock of \$5,000,000, and bonded debt of \$3,500,000. *Bradstreet's* reports of April 28, 1887, said the company is not "understood to be earning its interest account as yet, and it is being nursed along by those holding its securities, which are largely owned by banks, savings banks and trust companies. Its future depends on the disposition of its managers." According to the company's annual report on January 16 the liabilities were \$3,309,000, of which the bonded debt was \$2,399,000, and other debts, with collateral security, \$910,000. The assets consist of 7000 acres of coal land in the Hocking Valley, Ohio, valued at \$400 to \$500 per acre; about 300 houses, 3 large stores, 400 railroad cars, 4 miles of track, 3 coal mines fully equipped, 4 furnaces and a large amount of miscellaneous equipments.

The Iron Age

New York, Thursday, February 14, 1889.

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF, JR., - - EDITOR.
GEO. W. COPE, - - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS, - - - HARDWARE EDITOR.
JOHN S. KING, - - - BUSINESS MANAGER.

Our Imports of Iron and Steel.

The Bureau of Statistics has just issued its December report, showing the imports of merchandise for the calendar years, from which we compile the following table:

Imports of Iron and Steel, Gross Tons.

	1888.	1887.
Iron Ore.....	586,756	1,194,801
Pig Iron.....	196,892	467,522
Iron Scrap and Old Rails..	44,799	313,405
Steel Scrap.....	9,179	26,532
Bar Iron.....	31,745	36,219
Iron Rails.....	21	241
Steel Rails.....	60,989	137,588
Cotton Ties.....	30,305	21,675
Hoop, Band Scroll Iron.....	256	69
Steel Hoops, sheets or plates.....	23,411	24,004
Steel Blooms, Billets, Slabs or Bars.....	103,687	310,551
Sheet, Plate and Taggers Iron.....	6,239	7,153
Tin Plates.....	297,832	283,836
Wire Rods.....	101,812	149,368
Wire and Wire Rope.....	3,169	2,899
Anvils, Axes and Forgings	1,177	1,316
Chains.....	829	914
Totals.....	912,322	1,783,282

Excluding ore, there has been a falling off in the tonnage of our imports from 1,783,282 in 1887 to 912,322 tons in 1888. Omitting the tin plates, since we do not yet make in this country, the decline has been from 1,499,446 tons to 614,460 tons. It is probably best, however, to take into account the iron ore. Assuming that its iron contents average at least 50 per cent., we have a decline from 2,100,000 tons of iron and steel, in the raw and partly manufactured state, to about 910,000 tons. This is statistically a very rough way of putting it, but it gives numerical expression to a very important fact. Its significance would be emphasized if it were possible to show to what extent purchases for future delivery have been made a year ago and now. From a close study of the markets we feel convinced that the quantities of foreign material purchased during the past few months are very small indeed. The importations during the current year promise to be very small, and it may be truly said the market is practically in the hands of our manufacturers. Were the demand this year to be only as large as it was in 1888, then our home works would be called upon to produce enough to cover the falling off in imports. Unless there is a very sudden and a very material drop in prices abroad, of which there is not the slightest prospect now, there will be no danger of an invasion of foreign material. That fact in itself counts for a good deal. It leaves us to adjust by ourselves the balance between supply and demand. The former is, at present prices, critically near a sharp curtailment, while the latter is aided by the vigorous stimulant which admittedly low prices always prove.

Consumption during the year 1888 was certainly surprisingly large, considering the condition of the rail trade. Taking

into account production, the imports, and a very slight apparent decrease in stocks, the quantity of pig iron absorbed was not less than 6,689,399 gross tons. Let it be conceded that the odd 89,399 tons are Bessemer pig not accounted in the report of stocks unsold but accumulated by the rail mills; then we have in round numbers a consumption of 6,600,000 gross tons. We believe that the low prices now ruling will aid the growth of consumption of the thousand small articles which go into the hands of the masses, and which, though singly small, make up the great aggregate which surprised those who last year kept their eyes riveted on the rail trade. An improvement is possible without that branch of the industry, and the year 1889 may prove it, in spite of all gloomy prognostications. We have gone a little too fast lately and are now suffering for it. But it does not by any means follow that an adjustment may not be quickly made and the spring see a revulsion of feeling. Competition from abroad is certainly not to be feared, and that, of itself, is an important gain.

Unrestricted Reciprocity.

Stirring events are believed to be impending in Canada, as an outcome of the long-continued agitation on both sides of the boundary line in favor of improved commercial relations with the United States. The signal for action is the promised retirement from public life, at the end of the present parliamentary session, of Sir John Macdonald, Premier, leader of the Government party for the greater part of the last forty years. He is to be succeeded by Sir Charles Tupper, now Canadian Commissioner in England. Already R. W. Scott, the opposition leader in the Senate, openly declares in favor of unrestricted reciprocity. To the same effect, and still more significant at the present juncture, is the declaration of Sir Richard Cartwright, who, like Sir John, is a veteran statesman, and has for many years maintained a struggle against the conservative forces representing the Crown. In the Parliament at Ottawa, 7th inst., Mr. Cartwright gave notice of his intention to move the adoption of the following resolution:

That it has become a matter of extreme importance to the well-being of the people of the Dominion that the Government and Parliament of Canada should have the power of negotiating commercial treaties with foreign powers, and that an humble address be presented to Her Majesty praying that she will empower her representative, the Governor-General of Canada, to enter, by agent or representative of Canada, into direct communication with any foreign states for the purpose of negotiating commercial arrangements tending to the advantage of Canada, subject to the prior consent or subsequent approval of the Parliament of Canada, signified by an act.

This is interpreted as meaning that the independence of Canada shall be so far recognized by the Imperial Government that the Dominion shall be empowered to negotiate directly with Washington in regard to commercial relations without the intervention of the Crown. As the question stands, public opinion is much at variance, so that, while not a few advocate the removal of all barriers to traffic, others are protectionists in the strictest and most radical sense, others still clamor for "reciprocity," "commercial union,"

or "annexation," according to their individual proclivities or special interests. Withal, the opposition have no recognized leader. Sir Charles Tupper, as a member of the fisheries conference, gave evidence of being a skilled diplomatist, and, being yet in his vigor, is looked upon as well qualified to grapple with any question that may arise.

The Precious Metals in 1888.

Silver opened last year in the London market at 44½d per ounce and never again attained that figure during the whole twelvemonth, the lowest point reached being 41½d on May 19. Thence the course was upward, and it rapidly recovered to 42½d, continuing with few fluctuations until October and November, when the range was 43½d to 43½d, the year winding up at 42½d, the decline for the year thus being 2d. The course of prices is best shown in the following table:

Average Price.

January.....	44½	July.....	42½
February.....	44	August.....	42
March.....	43½	September.....	43½
April.....	43 11-16	October.....	43 1-16
May.....	43 1-16	November.....	48
June.....	42 1-16	December.....	42½

The average for the year being 42½d.

Previous Yearly Averages.

1876.....	52½	1882.....	51½
1877.....	54 13-16	1883.....	50 9-16
1878.....	52 9-16	1884.....	50½
1879.....	51½	1885.....	48½
1880.....	52½	1886.....	45½
1881.....	51 11-16	1887.....	44½

The price on February 9, 1889, was 42½d.

There has been an active demand for gold in London, especially for Brazil, the Argentine Republic, Spain, Russia and the Cape of Good Hope. The total export from London during the year was £14,250,000, against £8,700,000 in 1887, while the import was £15,000,000, against £10,000,000. The silver movement was considerably less, the export not exceeding £7,500,000, as compared with £7,620,000 in 1887; while there was imported £8,000,000, against £7,690,000. To supply with gold the countries named the United States had also to be drawn upon heavily, causing a general gold drain, which brought about a material advance in the discount rates in Europe, and during November was looked upon with some apprehension in Wall street.

Germany was last year the country that escaped the gold drain more than its neighbors, the local demand there being chiefly for the yellow metal, while but few 20-mark pieces were exported. It was different in France, the bank losing 100,000,000 francs. The situation of monetary matters was quite unfavorable there as regards silver, a good deal of it being shipped to that country from Italy and Belgium, so that an accumulation in the vaults of the banks of France took place to the amount of 1,228,000,000 francs. The bank now holds, included in the above amount, no less than 300,000,000 francs of Belgian and 250,000,000 Italian 5-franc pieces, with which it can do nothing for the time being under the arrangement with the Latin Union so long as the latter is not dissolved. In fact, the Bank of France has been seriously hampered at times in its dealings with French bankers and merchants owing to these 550,000,000 francs being blocked up

in a foreign coin, for which it cannot enforce reimbursement in available gold coin.

In England the metallic gold reserve declined last year, reduced to francs, from 498,000,000 to 484,000,000 francs, despite the \$750,000 excess of import above given. The total import and export movement of gold during the past 30 years exhibits some interesting changes, having been in millions of pounds sterling as follows:

	Import.	Export.
1858-1861.....	69.8	58.4
1862-1866.....	93.9	65.8
1867-1871.....	87.1	59.8
1872-1876.....	103.8	84.7
1877-1881.....	69.1	80
1882-1887.....	60	66
Totals.....	492.7	414.7

In Italy the national banks and banks of issue had last year an increase of 86,000,000 francs in gold, but the Government absorbed 44,000,000 francs in the same coin, leaving as security 44,000,000 of old Bourbon silver dollars. The amount of 5-franc pieces held in bank on December 31 last was 56,950,000 francs, of which 8,780,000 francs were coins of other nations belonging to the Latin Union. Spain has been a buyer of gold for the coinage of new alfonso's.

The Imperial Bank of Russia held at the close of 1888 28,463,000 roubles in gold, and only 7,290,000 roubles in silver. In the United States there were coined last year \$32,000,000, silver, exceeding the gold coinage of the year by a trifle, the amount of silver dollars accumulated in the Treasury now amounting to \$315,000,000, while the total amount of gold held in the country is \$700,000,000, of which the Treasury holds \$325,000,000. The United States produced last year \$34,000,000 of gold and \$55,000,000 of silver. In 1887 the gold production was \$38,000,000, and that of silver \$53,000,000. It does not appear likely that the Bland bill will be repealed this year, and the coinage of silver under its provisions will continue. Therefore the producers and holders of the white metal appear safe enough. At the same time, the report of the British Commission has raised the hopes of bi-metallists, and there is quite a clamor on their part, both in Germany and England, in favor of a renewed attempt at negotiation between those two countries to arrive at some agreement about the re-establishment of a silver standard alongside of the gold standard. We doubt whether any thing practical will result from this renewed agitation of the silver question, since the majority of the solid financial men in England feel convinced that the renewal of the silver standard is impracticable. Whatever the hopes and assertions of English and Continental bi-metallists may have been, it may be taken for granted that England will decline a representation at a new international coinage congress, and without England nothing can be done.

The Western people are anxious to build up new industries, and are not disposed to wait for the slow process of natural selection or the fitful action of private enterprise. A bill was introduced in the Wisconsin Assembly last week providing for an appropriation of \$15,000 to establish and maintain a station, with the necessary mulberry orchards, &c., to give a thorough trial of the practicability of silk culture in that State. A strong sentiment in favor

of the movement is reported to exist among the citizens. In the same week a bill was passed by the Kansas House of Representatives to encourage the manufacture of sugar in that State by enabling municipalities to vote bonds to aid in the construction of sugar factories. Any city of the second class is to be permitted to subscribe not over \$20,000, and any city of the third class, or township, or village, \$10,000. The voters are to pass upon the question at any general or special election. So strong is the popular sentiment in favor of this stimulus to the manufacture of sugar in Kansas that the bill was passed in opposition to the advice of leading lawyers, who insisted that the measure was unconstitutional.

Comparative Freight Rates on Coal.

The Interstate Commerce Commission are now busy hearing the evidence in the complaints of Coxe Bros. against the Lehigh Valley Railroad. The first complaint, that undue advantage in rates is given the Lehigh Valley Coal Company, has no great interest for the general public. The second complaint involves a question of importance to all users of coal. It is charged and admitted that this carrier, like all other coal roads, makes a large difference in freight rates between anthracite and bituminous coal. Coxe Bros. claim serious damage from this distinction, which they allege to be an unjust discrimination against themselves and in favor of all miners of soft coal. They demand that both kinds shall be carried by the railroad at the same tariff per ton per mile.

The question of comparative freight rates upon two articles which are more or less competitive, while a new one in the United States, has been already raised abroad. A case much like the present one was decided some 15 years ago in England. The Caledonian Railway had different rates for different descriptions of coal—a gas-coal rate and a common-coal rate. A colliery owner who shipped cannel coal, which was charged the higher rate, brought an action against the company. It was shown that gas produced from splint, or common coal, was inferior in quality and quantity to that produced from an equal amount of cannel coal. The court held, however, that splint and cannel coal had enough of gas producing quality in common to be competitive, and the cost of carriage being the same they must be transported at the same rate per ton per mile. If we accept this decision as conclusive it follows, of course, that Coxe Bros. must win their case, and that a higher rate upon anthracite is an injustice to it and an unfair favor to bituminous coal.

These English cases cannot, however, be unquestionably accepted as governing principles in this country. The English Railway Commissioners have been led into too much dependence upon mere cost of service as a test of all disputed cases. It will not do to say that because two shipments cost the carrier the same money that therefore the rates should be the same. Such a theory would compel dry goods and iron to be transported at the same tariff per ton, as is the rule in Germany. Our whole American system has been built up on the opposite theory of

value of service, that each article should be charged what its transportation was worth to the owner. A striking instance of the application of this theory is the tariff charged on ore bullion between Denver and Omaha. If it assays less than \$100 to the ton the rate is 25 cents; if it assays more than \$100 per ton, but the shipper is willing to agree to put that valuation upon it in case of loss, the rate is 35 cents; if shipper forwards at the actual valuation exceeding \$100 the rate is 75 cents. The attempt is here clearly made to have the railroad share in the profits accruing to the owner of the high-priced ores. The English decisions condemn this style of tariff making, and not a few of our own writers think it savors of confiscation, but, nevertheless, it is in accord with the principles to which our national railroad prosperity is largely due. The reason why so many of our cheap goods can be carried at such low rates (half the average European rate) is because the shipments which can afford a higher rate are charged accordingly.

If the rule of value of service be applied to the present contention, the justice of the claim that anthracite of all sizes be carried as low as bituminous becomes more than doubtful. It is true that the use of hard coal for manufacturing has decreased greatly, but much of this is owing to other causes than excessive freight rates; indeed, the changes in tariffs followed the changes in trade, and not *vice versa*. More and more is it apparent that for manufacturing our reliance is upon bituminous coal, and it is to be feared that any arbitrary arrangement of freight rates upon any other theory would only result in higher rates and higher prices upon steam-producing coal to our already burdened manufacturers. If an average must be struck, freights on the lower and cheaper qualities must be raised.

This applies more particularly to the larger sizes of anthracite now used almost exclusively for domestic purposes. As to the smaller kinds—such as buckwheat, and even culm—there is no doubt that their consumption for steam raising could be largely increased were they carried and sold at prices competitive with soft coal. It may be said that the solution of the difficulty may lie just here—that the carriers recognize a distinction between anthracite for domestic and for manufacturing use. Such a plan might relieve the miner of his surplus now stored about the mines, while at the same time granting a wider choice to certain factories and works. But to ask or expect that all sizes and kinds of coal, of whatever price or for whatever use, shall be carried at one and the same rate would be to put back the usefulness of our railroads to the crudeness of early times.

An encouraging feature of the Western trade situation is the increased business now reported by the railroads. Freight officials connected with the lines radiating from Chicago, particularly to the West and Northwest, state that their business has picked up rapidly in the past two weeks. The average improvement in the quantity of freight carried on these lines is estimated at 25 to 30 per cent. This is a very decided gain and the change is visible in every quarter affected by railroad interests. Freight solicitors were

but recently as importunate as sellers of second-hand clothing, while now they are recovering their usual dignity and do not plead for the business of small shippers. The decreased tonnage on some of the leading Western lines affected them so seriously that they were obliged to curtail the number of freight trains very heavily, thus reducing their employees and adding to the number of idle persons in the country. These trains are being restored as rapidly as the demand for freight room warrants, and a beneficial effect cannot but follow over a very broad expanse of territory. Manufacturers of railroad supplies are watching the changing conditions eagerly, believing that only a slight improvement is needed to encourage the railroads to make extensive repairs.

The post office appropriation bill represents a total of \$86,600,000, and among the items are upward of \$19,000,000 for railway service, as compared with the paltry sum of \$855,000 for foreign mails. A more liberal system for the encouragement of ocean mail transportation, looking to the ultimate benefits to be derived from the extension of our foreign commerce as a result of rapid and direct postal communication rather than to the costs of maintaining the service, is a subject which there is reason to believe will receive attention at an early day. The revival of American shipping, building up foreign markets and providing adequate facilities for communicating with foreign ports are interests that are one and inseparable. While other commercial nations are reaching out over the seas in all directions, establishing trading stations and founding colonies, merchants and manufacturers in the United States cannot afford longer to rest satisfied with passive inaction.

New York Exports for 1888.

The details of the Custom House statistics relating to the exports from the port of New York during the year ending December 31 show that there were shipped mowers and reapers valued at \$1,496,457; plows and cultivators, \$480,511; brass and manufactures of brass, \$202,214; clocks valued at \$1,028,427; 22,809 tons of copper ore and copper matte, \$2,781,419; copper, ingots and bars, 30,809,278 pounds, to the value of \$4,785,131, and other items as follows:

	Quantity.	Value.
Pig iron (2,240 pounds) tons.	735	\$15,677
Band, hoop and scroll iron, pounds.	57,855	2,214
Bar iron, pounds.	354,920	8,953
Car wheels, No.	8,188	74,675
Castings, not elsewhere specified.		111,902
Cutlery.		90,728
Firearms.		553,776
Ingots, bars and rods of steel, pounds.	301,300	12,822
Locks and other builders' hardware.		1,050,923
Machinery, not elsewhere specified.		7,011
Nails and spikes, cut.	8,325,600	8,567
Nails, wire, horse-shoe, tacks, &c., pounds.	1,161,522	124,405
Iron plates and sheets, pounds.	4,465,454	185,534
Steel plates and sheets, pounds.	38,238	2,097
Printing presses and parts of.		120,323
Steel railroad rails, tons.	5,000	173,451
Saws and tools.		1,329,555
Sewing-machines and parts.		1,325,959
Locomotives, No.	33	223,708
Stationary steam engines, No.	245	182,550
Steam boilers and parts of engines.		162,066
Stoves, ranges and parts.		190,979
Wire, pounds.	12,758,916	442,841
Iron and steel, all other manufactures of.		1,458,987

The Blast Furnaces

February 1, 1889.

As was to be expected, the demoralization in the iron and steel trades during January has led to some restriction of output, although thus far the relief is not great. It has come chiefly in the direction of blowing out of furnaces making Bessemer pig connected with rail mills. Thus the Bethlehem Iron Company entered February with only two of their seven stacks in blast, while the Union Steel Company, of Chicago, put out the three of their furnaces which had been at work for some time past. In all, the reduction of output of anthracite and coke furnaces combined is from 142,064 tons weekly on the 1st of January to 137,089 on the 1st of this month. A number of our correspondents, whose plants are ready to resume, report that they will allow them to remain idle while the markets are in the present condition. Others are not likely to make long-time purchases of raw materials at present prices, so that should their furnaces begin to work badly they can put them out without any complications of contracts entered into. One of the closest students of the situation, with exceptional facilities through his location for watching the drift of events, while acknowledging that for the first time in many months he is piling up iron, expresses the belief that a better feeling will prevail within 60 days. In fact, the first indications of it are said to be manifest even now.

For the anthracite furnaces we have the following data:

Anthracite Furnaces February 1.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New York.....	24	11	8,491	13	9,788
New Jersey.....	13	5	2,330	8	2,302
Spiegel.....	3	3	229	0	0
Pennsylvania:					
Lehigh Valley.....	44	25	9,472	19	6,468
Spiegel.....	1	1	70	0	0
Schuylkill Valley.....	38	25	8,494	13	3,880
U. S. Susquehanna Valley.....	17	11	8,543	6	1,256
Lebanon Valley.....	16	13	6,778	3	1,193
L. Susquehanna Valley.....	22	13	4,780	9	2,050
Total.....	178	107	89,187	71	21,016

For a year past our records show the following:

	Furnaces in blast.	Capacity per week.
February 1, 1889.....	107	39,187
January 1, 1889.....	107	38,728
December 1, 1888.....	99	34,879
November 1.....	95	33,845
October 1.....	95	33,728
September 1.....	92	33,541
August 1.....	93	33,297
July 1.....	92	32,478
June 1.....	99	32,418
May 1.....	96	31,006
April 1.....	94	30,496
March 1.....	98	28,598
February 1.....	97	29,959
January 1.....	118	38,206
December 1, 1887.....	122	39,487
November 1.....	124	40,028
October 1.....	123	39,440
September 1.....	125	38,338
August 1.....	129	37,930
July 1.....	138	40,742

In New York and New Jersey no change has taken place. In the latter State the figures for the capacity at work have been increased in accordance with the higher position, as a producer, occupied by the Andover Furnace, in the Lehigh Valley. Bethlehem, as already noted, is running only two furnaces. In the Schuylkill Valley Marion blew in on the 10th, and Norway on the 16th ultimo. One of the Pioneer furnaces was to be blown out early in this month. The small furnace, which has not been running for some time, is to be rebuilt. On the Upper

Susquehanna the same plants are producing, to which was added, on the 10th ultimo, the Marshall, which has been remodeled and re-equipped.

In the Lebanon Valley No. 2 Sheridan has chilled. One of the Bird-Coleman stacks is still undergoing repairs. Otherwise the district is busy, as usual.

The coke furnaces opened February with the following status:

Coke Furnaces February 1.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New York.....	3	1	1,191	2	2,100
Pennsylvania:					
Pittsburgh district.....	17	18	20,330	1	346
Spiegel.....	1	1	611	0	0
Shenango Valley.....	19	15	10,355	4	2,305
Juniata and Conemaugh Valley.....	18	11	5,332	7	2,480
Spiegel.....	1	0	0	1	250
Yough Valley.....	5	4	1,651	1	600
Miscellaneous.....	4	3	1,770	1	650
Maryland.....	2	0	0	2	370
West Virginia.....	6	3	2,165	3	588
Ohio:					
Mahoning Valley.....	14	11	8,086	3	2,788
Central and Northern.....	18	13	9,041	5	3,746
Hocking Valley.....	14	8	3,038	6	1,340
Hanging Rock.....	19	9	2,177	4	960
Indiana.....	3	2	338	0	0
Illinois.....	12	7	8,512	5	4,318
Spiegel.....	1	1	642	0	0
Wisconsin.....	4	2	867	2	1,260
Missouri.....	6	1	594	5	2,130
Colorado.....	2	1	480	1	480
The South:					
Virginia.....	12	9	4,005	3	2,177
Kentucky.....	4	3	1,050	1	350
Alabama.....	21	18	10,887	3	1,250
Tennessee.....	11	10	4,974	1	250
Georgia.....	2	1	501	1	250
Total.....	212	150	97,518	63	21,016

As compared with previous months, these figures stand as follows:

	No. of furnaces.	Capacity per week.
February 1, 1889.....	150	57,735
January 1, 1889.....	157	57,735
December 1.....	151	57,735
November 1, 1888.....	146	57,735
October 1.....	137	57,735
September 1.....	138	57,735
August 1.....	122	57,735
July 1.....	131	57,735
June 1.....	128	57,735
May 1.....	130	57,735
April 1.....	128	57,735
March 1.....	128	57,735
February 1.....	126	57,735
January 1.....	143	57,735
December 1, 1887.....	144	57,735
November 1.....	151	57,735
October 1.....	152	57,735

In the Pittsburgh district Clinton is out, and two Eliza furnaces have ceased operations. This, however, has been more than counterbalanced by the heavy output of the Edgar Thomson furnaces, which have been producing close to 10,000 tons a week in January, not counting the furnace which is on Spiegel and ferro. In the Shenango Valley Neshannock, which stopped on the 28th of December, is still out. Rosena continues its heavy product, having made in January close upon 1200 tons of iron in a week. Nothing new is reported from the Juniata and Conemaugh valleys except that No. 2 Rockhill is to begin work during the latter half of this month. Among the furnaces grouped under "miscellaneous" one stack has stopped for repairs.

In Maryland Catocin is banked, and is stocking up on ore. In West Virginia the majority of the plants were running light in January. In the Mahoning Valley Grace resumed in January, but, on the other hand, Thomas lost stock-house and hoisting-house by fire on the 10th ult. They are being rebuilt of iron, and production was expected to begin again on or about the 20th of this month. In the Hocking Valley there have been no changes. We may note, however, that B Floodwood has done some very good work, making an average of a little over 1000 tons of iron per week, which is far above the record of any other

furnace in the district. In the Hanging Rock region Sarah blew in on the 23d ult. and Wellston was also added to the list of producers during January.

In Illinois the three large furnaces of the Union Steel Company have stopped, thus reducing the active capacity of the State by about 2800 tons a week. In Wisconsin Minerva is out. In Missouri one of the stacks of the St. Louis Iron and Steel Company has blown in.

In the South Kentucky shows a lessened output through the blowing out of No. 1 Ashland. In Alabama Mary Pratt has gone out for repairs. On the other hand, Williamson was blown in toward the end of the month.

The Tennessee Coal and Iron Company are running every one of their completed furnaces in Alabama and Tennessee, nine in number, and producing at the rate of 23,000 tons per month. Trussville and the second De Bardeleben are the only two new furnaces which will begin work in the near future.

The status of the charcoal furnaces on the 1st of the month was as follows:

Charcoal Furnaces February 1.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New England.....	14	8	905	6	495
New York.....	10	3	361	7	570
Pennsylvania.....	23	5	450	18	624
Maryland.....	8	4	389	4	250
Virginia.....	23	2	111	21	835
West Virginia.....	3	0	0	3	165
Ohio.....	18	6	414	12	863
Kentucky.....	2	1	80	1	75
North Carolina.....	2	1	70	1	70
Tennessee.....	9	3	725	6	1,205
Georgia.....	2	1	60	1	54
Alabama.....	10	8	1,668	2	470
Michigan.....	25	11	3,517	14	3,370
Minnesota.....	1	0	0	1	190
Missouri.....	3	2	564	1	150
Wisconsin.....	10	4	1,484	6	810
Texas.....	1	1	146	0	0
California.....	1	0	0	1	210
Washington Ter.....	1	1	270	0	0
Oregon.....	1	1	275	0	0
Total Feb. 1.....	167	62	11,219	105	10,406
Total Jan. 1.....	169	67	11,946	102	9,822
Total Dec. 1.....	169	71	12,286	98	9,397
Total Nov. 1.....	169	73	12,724	96	8,941
Total Oct. 1.....	175	71	11,619	104	9,063
Total Sept. 1.....	176	67	11,243	109	10,004
Total Aug. 1.....	176	65	11,137	111	10,095

There are no new developments in New England or in New York. In Pennsylvania we may note that Pine Grove Furnace has blown out, to be relined from the foundation to the tunnel head. The heating surface of the hot-blast stove is to be enlarged, and a system is to be introduced of enriching the gas for the hot oven and the boilers by the addition of oil spray under heat and pressure. In Maryland No. 1 Maryland Furnace is to be put into blast at an early date. In Virginia Walton stopped on the 11th ult. In Kentucky Hunnewell ceased operations on the 20th. In the Hanging Rock region the number of producers has been lessened by the blowing out, for a new hearth and general repairs, of the Bloom Furnace.

In Michigan Martel stopped on January 5, leaving only 11 stacks producing. Official reports from every one of them show the January output to have been 15,906 gross tons, some of the furnaces doing particularly good work. In the South La Grange went out for repairs, while in Alabama Tecumseh is again at work. The Old Alcalde Furnace, at Rusk, Texas, blew in on January 24. On the whole, the tendency is toward a smaller output of our charcoal plants for the present. The opening of navigation will, however, later on lead to a resumption of operations by a number of furnaces in the Northwest.

A Pittsburgh Board of Trade.—A committee, consisting of some of the most prominent citizens of Pittsburgh, have

sent a circular letter to a large number of business men of that city, asking their co-operation in the formation of a Board of Trade, such as exists in other large cities. The committee believes that the city of Pittsburgh, owing to its vast industries and great mercantile developments, demands an organization of this kind. It is proposed to secure a central location and erect a building thereon similar to those used by boards of trade in other cities, and of sufficient size to accommodate the Chamber of Commerce and the Grain, Coal, Coke, Builders' and Grocers' exchanges. The recipients of the letters are requested to give their views on the subject, and at the same time say how much money they would be willing to subscribe to such an enterprise.

Copper Production in U. S. in 1888.

PRELIMINARY STATEMENT.

David T. Day, geologist in charge, Division of Mining Statistics and Technology, Washington, has issued the following preliminary statement of copper production and consumption in the United States in 1888, by C. Kirchhoff, Jr., agent U. S. Geological Survey:

From returns obtained from the majority of producers, and checked and supplemented by full reports from nearly all the refiners in the country, the following preliminary estimate of the production of copper in the United States is compiled:

Total Copper Production in the United States.

	1887.	1888.
Pounds.	Pounds.	
Lake Superior.....	75,471,890	86,404,993
Arizona.....	17,720,462	31,797,300
Montana.....	78,699,677	97,897,968
New Mexico.....	283,664	1,631,271
California.....	1,600,000	1,170,021
Colorado.....	2,012,027	1,221,100
Utah.....	2,500,000	2,131,047
Wyoming.....		232,819
Nevada.....		50,000
Idaho.....		50,000
Maine and New Hampshire.....		
Vermont.....	200,000	271,631
Southern States.....		18,201
Lead desilverizers, &c..	2,432,804	2,618,074
Total domestic copper.....	180,920,524	225,494,425
From imported pyrites and ores.....	3,750,000	4,909,156
Total (including copper from imported pyrites.....)	184,670,524	230,403,581

The production of the principal Lake Superior mines was as follows, December fine copper yield being estimated by the producers from known output of "mineral":

Production of Lake Superior Copper Mines, 1887 and 1888.

Mines.	Pounds.	Pounds.
Calumet and Hecla.....	46,016,123	50,401,367
Quincy.....	5,603,691	6,300,000
Osceola.....	3,574,972	4,130,085
Franklin.....	3,915,838	3,645,720
Allouez.....	885,010	300,000
Atlantic.....	3,641,865	3,976,000
Central.....	2,199,133	1,750,000
Copper Falls.....	560,000	1,160,000
Phoenix.....	11,000	
Huron.....	1,484,108	2,370,857
Ridge.....	84,902	50,895
Wolverine.....	2,300	
National.....	25,187	
Tamarack.....	7,306,529	11,411,325
Kearsarge.....	21,287	631,856
Evergreen Bluff.....		26,888
Sundry companies—tributers.....	50,000	50,000
Total.....	75,471,890	86,404,993

The production is even now proceeding at a greater rate, and a very considerable increase is expected should prices continue at or near the present level of about 16½ cents for Lake copper, unless the French syndicate and the mines whose product it has contracted for agree upon some reduction of output. It is reported that on January 1, 1888, the stock in the hands of the

syndicate in this country was 59,000,000 pounds. This includes fine copper in matte and ore in transit and at works, with the exception of some Anaconda material.

Of the total quantity of copper produced in the United States in 1888 about 158,000,000 pounds was refined in this country.

Consumption.

Consumption has undoubtedly fallen off, although not to the extent which was probably widely expected. Reports from 109 consumers—among them nearly all the great copper and brass rolling mills and the leading brass founders, including also large new concerns which did little or nothing in 1887, like the Tamarack and Osceola Mfg. Company and the Hartman Steel Company—reports from these works show an aggregate consumption of new copper in 1888 of 76,124,641 pounds, against 82,458,378 pounds in 1887. This indicates a falling off of 7.68 per cent. The true effect of high prices is, however, more correctly appreciated when the fact is taken into account that the very rapid rate of increase in copper consumption of former years has been overcome. In 1887 this increase amounted to 14 per cent. The condition of general business in 1888 was favorable enough, so far as the consumption of metals in this country was concerned. The quantity of lead and spelter absorbed showed the effects of a natural growth, and leaving out of account the lessened consumption of steel rails, the quantity of iron and steel which found its way into the hands of purchasers was normal. These facts admit of drawing the inference that the cessation of a natural increase of and the substitution therefor of a notable decrease in the consumption of copper in the United States was due directly to the abnormally high price for the metal established through the operations of the French syndicate. It must be distinctly stated that the figures for the consumption given do not cover more than a part of the quantities absorbed in the United States. They are believed, however, to represent very closely the true ratio which would be reached were it possible to obtain the complete data. The principal ground for this belief is the fact that all the important industries into which copper enters as a raw material are represented in the returns by the majority of the concerns, large and small.

Southern Pig Iron Freights.

The Queen and Crescent route has issued Tariff No. 11, of rates on pig iron, which took effect on February 1. We give below the rates to the principal points, per ton of 2268 pounds:

From	Dayton and Rockwood, Tenn.	Chattanooga, Tenn.	Rising Fawn, Ga.	Atlanta, Bessemer, Birmingham, Gadsden and Wheeling, Ala.	Florence and Sheffield, Ala.	Anniston district.
To						
Buffalo.....	\$4.05	\$4.25	\$4.50	\$4.75	\$4.50	\$4.75
Chicago.....	3.56	3.75	4.00	4.00	3.75	4.25
Columbus.....	2.80	3.00	3.25	3.50	3.25	3.50
Detroit.....	3.55	3.75	4.00	4.00	3.75	4.25
Indianapolis.....	2.80	3.00	3.25	3.25	3.00	3.50
Kansas City.....	6.49	5.49	5.49	5.49		
Louisville.....	2.05	2.25	2.50	2.50	2.25	2.75
Milwaukee.....	3.95	4.15	4.40	4.40	4.15	4.65
Omaha, Neb.....	5.63	5.83	5.83	5.83		
Pittsburgh.....	3.95	4.15	4.40	4.65	4.40	4.65
St. Louis.....	2.80	3.00	3.25	3.25		
St. Paul.....	5.18	5.38	5.63	5.63		
Toledo, O.....	3.30	3.50	3.75	4.00	3.75	4.00
Wheeling.....						
W. Va.....	3.95	4.15	4.40	4.65	4.40	4.65
Wilmington, Del.....	5.45	5.65	5.90	6.15	5.90	6.15

The furnaces classed under the Anniston district by us include Anniston, Clifton, Jenifer and Ironaton.

Pig Iron Warrants.

OPINIONS OF THE TRADE.

One of the leading topics of discussion among iron makers, commission merchants and others interested in the iron trade has been the plan of creating American pig iron warrants. With the object of affording an opportunity to ascertain the attitude of different branches of the trade, and in various sections of the country, *The Iron Age* has called upon a large number of leading pig iron makers, iron manufacturers and commission merchants to express their opinions. Beginning, then, first with the manufacturers of pig iron, we print below

What Southern Makers Say.

The managing director of a large Southern iron company puts himself on record as follows:

The main benefit of pig iron warrants would be in providing a market for iron when prices are, from any cause, unduly depressed. The great want now is cash buyers for iron to be delivered promptly, and if a system having the approval of the financial world could be adopted it would offer a form of investment much more secure than many forms now in favor, such as stocks and bonds, the real value of which is in a good many cases not above question. I believe there are a great many capitalists in the country who have more or less interest in and acquaintance with the iron industry, and when iron is low in price these would be glad of an opportunity to invest their money, and would do so with less hesitation than it requires to buy some of the paper investments that are always being temptingly offered.

There have been sold to the public in the past two or three years through the medium of the Stock Exchange and through financial houses many millions of dollars of stocks and bonds of iron enterprises that promise to turn out very poor investments. How much better it would have been if this financial current could have been diverted into iron itself, where there would be an opportunity of profitable investment. Certainly the principal would be safely invested, if nothing more. It is evident that those who have invested in the stocks and bonds of these iron enterprises will fare badly. When investors learn of the misfortunes that have overtaken some of the Sheffield adventures and a late one at Nashville there is reason to fear the effect will be disastrous to other investments of like character that are not based upon a solid foundation.

The institution of the warrant system in the pig iron trade would do much to check the tide of disaster arising from the unwise and hasty investment of capital in joint stock companies in the iron trade, by affording capital an opportunity to take a part in carrying iron stocks for the furnaces which they themselves have not the means to hold. Sooner or later the truth will be made known regarding the manufacture of pig iron in this country. I think there has been very little profit in the business, even to those best situated for its economical manufacture, and that iron has generally been sold without profit for some years past. Such an institution as you mention will be the means of letting daylight into the trade, and I believe it would have a wholesome effect if the public generally should get acquainted with the business through the warrant system. I believe it would prevent unwise expansion, and result finally in putting the iron manufacture upon a solid foundation once more.

I know there are a great many objections to the proposed warrant system, but such objections are not made by those who take a broad view of the question, nor will they stand if critically examined in the light of large business experience. One of the principal objections is that if the public become buyers at low prices they will also appear as sellers when prices are advanced, and such stocks will be thrown on the market, thus preventing a rise. I do not take any such view of it. This country has grown wealthy in the past 20 years, and there is an abundance of money which should be wisely distributed in all the channels of trade. In no other business is it true that the producers have to bear the whole burden of manufacturing and distribution and take all the risks of credit, as is done in the iron trade. The introduction of public capital would be of vast assistance in this respect, and 1,000,000 tons or 2,000,000 tons could be easily carried, and would form a reserve stock which would not be thrown upon the market unless there was a great rise, and then, in all probability, the public would let go very slowly. A reserve stock of 1,000,000 tons would not, in my judgement, prevent a fair rise in price of, say, \$5 per ton when trade conditions were favorable. It might prevent a \$10 advance, which would perhaps be undesirable. It would form a great balance-wheel sorely needed, preventing such very low prices as we have had in the past four years; also preventing the foolish speculation of which we had a sample in 1880. From every point of view I can only commend the scheme as one of great good to the iron trade. In fact, I believe that those who most earnestly advocate it now, even from selfish motives, have but slight conception of the benefits that will arise from it when it is properly understood, and it will take some years before they realize it.

The president of a Southern works, interested in furnaces and rolling mills, writes:

I am inclined to think that the operation of the warrant company would be beneficial, rather than otherwise, to the producers of pig iron. One difficulty now is that there is no elasticity to the trade. You can gather what I mean from this: Supposing the cost of iron to be \$18 at the furnaces. If this can be put in storage for, say, 25 cents per ton, and warrants issued to the amount of, say, \$10 per ton, which can be used as collateral for getting money, it will obviate the necessity of the furnaces selling ahead to any such extent as they do at this time. The furnaces could easily carry \$3 per ton, or the difference between the security value of the warrants and the cost of the iron, whereas they could not carry the whole \$18, and are compelled to realize whatever the price is in order to meet maturing obligations. This would enable furnaces to hold their iron when prices were below cost, and use warrants as collateral, and thus be relieved without sacrificing their product, as they are compelled to do now. Very few furnaces have any working capital, especially in the South, and are unable, according to the present conditions of things, to borrow money in the cheaper centers, and they cannot carry their immense output on the limited banking capital at the trade centers here; whereas, the storage warrants would enable them to go to the Eastern markets and borrow money, and thus carry on their business without, as I said before, this enormous loss. I believe, further, that it will enable the furnaces to get together and determine approximately on a price at which they will sell, whereas, this is impossible under the present mode of selling through agents, as the furnaces have little control over prices the way things are now and have been.

Agents who have no interest in the concerns are hawking the iron about, and it is not infrequently the case that agents for the same company are bidding against each other for the trade, and this without the knowledge of the companies themselves. The furnaces try to avoid this by having agents in different trade centers, and allow them only to operate in certain territories; but, by connivance and one scheme and another, the agents get around this, and the furnaces are made to bear the burden. It costs now 35 to 50 cents per ton to sell iron through agents, the latter taking no risks; and the result is many sales are made to parties not deserving credit. The furnace companies are unable to prevent it, not being on the ground nor acquainted with the parties. I believe that the storage system would have the effect to wipe out this whole abuse, and where iron is shipped from storage yard we shall have no difficulty about quality or short weights. I can see no trouble resulting from making iron a medium for speculation, and believe if it has the same result upon iron as it has on cotton, oil and other mediums, my impression is it will have a tendency to steady the market, as it will undoubtedly increase stocks and give us better control of the American market than under the present order of things. On the whole, I am heartily in favor of the scheme, and believe furnace proprietors throughout the South are of the same opinion. I see no reason why this arrangement should not be as popular in the North as here with the furnaces that make iron for the trade.

A furnace company in the Birmingham district say:

It seems to us that if the surplus iron now being made were placed in yard instead of being put on the market the immediate effect would be beneficial. If a considerable part of the output of furnaces were absorbed for, say, several years, prices might be high enough to stimulate production beyond the consumptive wants of the country, and if this should happen with a large stock of iron in yards the effects might be disastrous. In other words, we believe that the immediate effect of the warrant system would benefit the producers, and good results might follow for several years. But whether the permanent interests of iron producers would be benefited by having a large stock of iron in yard represented by warrants in the hands of speculators remains to be seen. We are not disposed to regard the movement as a good one.

The manager of a very important concern puts himself on record as follows:

Our company have believed that the movement would be beneficial, and have consented to join in it to such an extent as may seem desirable to us in the future. I do not myself believe it will be beneficial. I form this opinion from the following facts and opinions: In Scotland a warrant is a warrant, and there is an end of it. It calls for the delivery of a fixed quantity of iron of one uniform grade, of any "g. m. b.," or good merchantable brand, at a fixed place. There is therefore nothing for an investor to do but to bear in mind the fluctuation of prices, and to know whether at any given time the price is high or low. This undoubtedly leads to a large investment in Connal's warrants at times of cheap iron. Under the plans of the American company, a buyer of warrants must be prepared to know the different market values of every separate brand, and the relative freight rates to consuming points from each separate storage yard, and the relative values of every separate grade of iron. This practically presupposes sufficient technical information to rule out every outside buyer, and to leave the market in the hands of consumers who already know these matters.

Now, if consumers would buy the iron they use, or a large part of it, in the form of warrants, it would be an advantage to the producers, for they would get their money more quickly, and without risk of loss; they would have sufficient commission to pay the expense of yarding the iron; they would have no disputes as to shortage or quality after the iron had passed into the control of the buyer. For the converse of the same reasons the buyers would not be likely to buy much iron in that form, and probably none at all as long as they could get what they want from the producers. It would, however, at a time like the present be an advantage to a consumer to buy a supply for two or three years, and carry it on these warrants at a low rate of interest. Unless, therefore, the consumers can be induced or impelled to buy the warrants, I think the scheme will only amount to a means for enabling producers to hold their product and borrow on it when prices are low. I do not think this is good for the market, as it will keep weak makers in blast when they ought to go out. We have seen this in Scotland, where furnaces have gone steadily on for years, losing money and storing their iron, and turning the warrants into cash with which to meet maturing bills. The accumulation of stocks in private hands and consequent lessening of make is the most natural corrective of a demoralized market, and I fear the warrant system would tend to avert the prompt application of this medicine when needed.

One of the largest manufacturers of iron in Virginia holds the following views:

The names published as being behind the movement should give it great solidity, commercially and financially, and if the scheme could be carried out just as outlined, and all the makers of pig iron would agree to go into it, it would undoubtedly be for the benefit of all. The plan is imperfect in that it does not indicate what method is to be taken with those who do not choose to go in, while the reference to the beautiful results of the operations of the Standard Oil Company seems ominous. It is at least unfortunate. Those who recollect the "freezing out" of the oil operators who refused to come under the Standard yoke in the early days of that enterprise (?) cannot look forward with any relish to a possibility of the application of the same methods to their own undertakings.

At the time that coal oil fluctuated so wildly in value the variation in the price of pig iron was nearly as great, when the nature of the two commodities is considered. The probabilities of seeing iron go to \$70 per ton seem no greater now than they do of seeing petroleum go to \$7 per barrel. The geographical relation of furnaces to each other—the situation of each in relation to its supply of materials—differences in product and different systems of grading—all seem to suggest difficulties that must occur to every one. These, however, could probably be, in a great degree, overcome by so powerful a combination as the one sought to be established. In this power lies the danger, and I hope every iron maker who values independence and the right to carry on business in his own way will put every possible obstacle in the way of this odious scheme.

Another Southern maker writes:

We make only charcoal iron, which will for some time find its own market. Generally speaking, I should think the scheme advantageous to the large new plants favorably situated to manufacture at the lowest figures, and who have immense quantities of product to take care of. The law of supply and demand will in any event ultimately give them the market, to the exclusion of the less favorably situated, but I think the proposed system would

hasten this result by stimulating production without reference to consumption. I would expect lower and constantly declining prices so long as accumulation continued, until a very nice balance between production and consumption was reached, and the accumulated stock in store should remain nearly constant, or such an aggregate figure as to prevent consumers' feeling uncomfortable as to supply.

A prominent Southern ironmaster writes as follows:

I do not regard the system of pig iron warrants with favor. Anything that tends to make speculators of producers must necessarily work great injury to the trade in general, and eventually ruin the manufacturer who undertakes to store his product and borrow money on it. If the furnaces store their product, of course the stock of iron increases, and so long as this is the case prices will decrease, and beyond doubt end in a panic that would ruin every furnace that had borrowed money on its product. If manufacturers desire to become speculators they had best close up their shops and carry on the business through the most approved channels.

Anthracite Pig Producers.

From furnacemen in Eastern Pennsylvania, New Jersey and New York we are in the position to present the following expressions of opinion. One of the makers on the Hudson River writes:

From the names connected with the project I should judge one object in view was to float heavy investments in blast furnaces in a section of the country where the building of them has been excessive for a few years past. It has now gone so far that the question has to be met. Where a market for all this production of iron is to be found at remunerative prices, and where is the money to come from to keep these furnaces in operation? I am unable to say what effect the use of such warrants will have on our pig iron business, but it seems to me that this country is too large to carry out such a scheme. Pig iron will not stand much expense to the maker for transportation, salaries, commissions and interest. In my judgment the better way is to put out part of the furnaces and make iron only to supply the demand.

B. G. Clarke, president of the Thomas Iron Company, writes:

My most serious objection, as an iron maker, is that it will enable parties to continue the making of iron and piling it in excess of the requirements of the country when the demand is not equal to the supply. The price, necessarily, is much affected, and if it were possible for the warrant company to control the output of iron for an indefinite period, and therefore put up prices of iron, it would induce parties to build new works and increase the supply beyond the requirements of the country. Dealing in warrants, as a rule, is simply gambling, like selling puts and calls. The warrants sold in Scotland are not for the delivery of the iron for use, but for speculation. A Scotch warrant is 500 tons, two-thirds No. 1 and one-third No. 3. Users of our iron would not buy on these terms. Rolling mills and pipe makers use No. 2 and No. 3. Foundrymen use No. 1 and No. 2 only; consequently a warrant would not suit either of the above parties.

The active member of a very large Northern concern deeply interested in the anthracite pig iron manufacture writes:

In reply to your inquiry as to effect on our business of a speculation by the public in the proposed pig iron warrants, I would say that I think it would more likely prove an injury than a benefit to us. As matters are now prices are regulated by the laws

of supply and demand practically, while if warrants are to be dealt in largely and the product of our furnaces sold many times over fictitious values might prevail. As in railroad stocks, oil certificates and cereals cliques might be formed by outsiders who would raise or lower our prices as their temporary profits might seem likely to accrue. With a large surplus stock of iron on hand the market could easily be "beared" and higher prices would be difficult to obtain with so much iron always for sale and ready in stock to be delivered. Even now, because we are thought to be accumulating a little iron, prices drop, and it strikes us they would always be maintained with a well known large surplus in stock. As against the theory that a surplus would prevent sudden advances and reactions in boom times, it would seem likely that it might prove just the contrary, for with a promising market speculators would buy up the surplus and "corner" it for the rise, and, as in the case of some railroad stock "squeezes," prices would go way above the limits that would follow a sudden demand simply from consumers. Customers might even have to face a corner both in the English and our warrants, for capital only would be required to accomplish the result, so completely would the warrants represent the surplus on both sides. But I do not apprehend any great sudden rises in the future, such as we had in 1879, if trade is left to itself, for the number of idle furnaces ready to blow in on short notice is much larger than ever before and supplies of fuel and ores are greater, and capacities to meet any sudden demand for them far in excess of the period when we had our great boom of 1879.

From the Schuylkill Valley comes the following:

I believe that the issue of pig iron warrants will have the effect to prevent ruinous prices and help the weak manufacturers of pig iron, and, so far, affect my interest favorably. On the other hand, it will enable weak parties to continue in blast, and keep up the overproduction that now exists, and, to some extent, counteract the advantages. Overproduction is the main cause of our trouble. The plan of issuing warrants will, no doubt, bring much outside capital to help to carry the surplus iron, and in that way steady the price. I do not propose to use their storage yards, but yet hope that the system might produce favorable results in steadying prices.

From the same district comes the following letter:

One of the representatives of the American Pig Iron Storage Warrant Company spent several hours with us last week trying to induce us to favor their plan, but we refused for the present to allow them to use our name. They propose to loan money on the very best kind of security, and you are bound to them for 20 years. As one of our directors remarked, "It is very nice for the cats, but bad for the mice." We have borrowed money on pig iron, and may have to do it again, but we shall expect to do it on better terms than offered by the warrant company. It may be a good thing for some of the Southern furnace companies, but most of the older concerns in the North, I think, can get along without their help. If I could see how their system would steady or stiffen prices it would receive my favorable consideration. I shall be glad to see any movement that will check the Thomas or any other company in what seems to be needless reductions in prices.

An old established firm of iron makers in Eastern Pennsylvania take the following ground:

We are opposed to all combinations of capital or labor, and to all kinds of trusts

whether sugar, oil or pig iron. We believe in legitimate trade governed by demand and supply. One of the greatest curses of the manufacture of pig iron is want of capital, and we believe the "iron storage warrant company" will only aggravate this by carrying those along who cannot sell or take care of their output. Nobody has any business to go into pig iron making without the capital and facilities to produce same cheaply. For over 45 years we have never blown out a furnace on account of bad markets, but steadily piled the pig iron until wanted, and we never lost any money by the operation.

The Mahoning Valley Makers

make the following points, the first saying:

Our impression is that the iron storage warrant company will be used mostly by Southern companies, and instead of putting their iron on the market below cost to raise money, they will use storage warrants, and in that way the price of pig iron will be equalized and keep about the same. We are in favor of low-priced pig iron and low-priced raw material. We notice that when prices are low there are many more uses for iron, which makes the consumption large. The warehouse company will have a tendency to keep prices low—that is, if they are patronized very much by pig iron men. We do not think the Northern furnaces will do it very much, as they have had facilities of this kind during the last few years in the different warehouse companies established in the North. As we understand the Southern furnace companies are mostly bonded, and that interest must be paid, they will in dull times use the warehouse company to raise money to pay their interest as it comes due. Our opinion is that the warehouse company will have a tendency to keep prices low, and as we have no foreign outlet, on account of high-priced labor, as England has, there will be much trouble if stocks accumulate.

Another leading maker in that section writes:

I do not believe the establishment of such a storage warrant company would be for the best interests of the pig iron manufacturers of this section. Viewed from the standpoint of a banker or money-lender, it is easy to see why so many strong and influential stockholders have given their names to the enterprise. All the advantages of the scheme are in their favor, and if they can find people enough to put up iron and borrow money they will be successful, as under their prospectus they simply take iron into their keeping and issue a warrant, for which the producer is obliged to pay. The furnace companies in our vicinity have no trouble whatever in borrowing what money is necessary to carry accumulated stocks without going to the expense of paying an arbitrary storage and carrying charge, outside of the interest, for the privilege of so doing. We can easily see how it would be a temporary advantage for furnace companies whose financial condition is weak, as it would enable them to keep their plants in operation and pile up iron, with a hope that a rise in the market eventually would let them out. The argument used by the promoters of the scheme, that an accumulation of stocks to the amount of 1,000,000 or 2,000,000 of tons would be a safeguard against great fluctuations in the market, is very deceiving in its import. Every legitimate manufacturer knows that when the stocks of iron in the country increase, it is always the occasion of low prices, and a great argument used by the buyer to keep prices down. We had a most forcible example of this in the large amount of Marshall iron that some years ago was put in the storage company's hands in the city of Pittsburgh. Storage certificates were

issued on this iron on which the banks loaned money. It had a depressing effect on the market, for whenever a quotation was made on iron some one who had loaned money on the certificates, and was tired of carrying it, would sell it at a sacrifice. The banks were the only ones who were benefited by the movement, and to the manufacturer it was "a thorn in the flesh" until it was all sold. We do not see how it is possible for any well organized and sound financial concern, who expect at all times to pay 100 cents on the dollar, and give to their stock-holders a reasonable interest on their investment, to pay a storage charge and encourage a scheme that will ever be a wet blanket upon the trade. The large productive pig iron capacity of this country as it now stands will prevent any great fluctuations in the price of this commodity, and we believe the best way to bring about an improvement in the iron market is to curtail production rather than to adopt any measure whereby inducements are offered to produce something that is not wanted. In conversation with many of the prominent iron manufacturers of the Mahoning Valley, it is the general sentiment that the success of the warrant company would seriously impair business here.

Still another large producer in the Mahoning Valley puts it as follows:

We think that the creation of pig iron warrants would be a good thing for the South, and consequently a good thing for the entire country. Southern iron is, as you know, almost uniform in quality, and the term "Southern iron" is almost generic; therefore it would be much easier handled. Our Southern friends have large interest accounts, nearly all of them have their property bonded, and are obliged, in order to realize, to pay fixed charges, whether the earnings warrant it or not. I know of a recent large sale made at a low price, and the agent expressly stated that the money was needed to pay the coming interest. It would be impossible in the North to get up any general scheme of this kind, as there are so many varieties of iron made, and the Northern furnaces, as a rule, are in a very good financial condition, and do not need to hypothecate their product in order to raise money.

A producer in the Hanging Rock region says: "We think pig iron stored and held for warrants would have about the same effect on the market as surplus stock held in any other way. We are not well enough posted in regard to the plans of the company lately organized to speak more definitely. We are disposed to regard the movement unfavorably."

One particularly interesting point is the possible effect which the plan of introducing an American warrant system—it successful—might have upon the business of

Iron Commission Merchants.

Some of the leading firms at the principal distributing points have written to *The Iron Age* on the subject, the first four letters being from

NEW YORK MERCHANTS.

A firm dealing largely in iron writes:

To buy and sell pig iron warrants on brokerage is one thing; and to sell pig iron on commission, as furnace agents, is another; and they are very wide apart, although both lines of business may be readily done by one house. While at first glance we were unfavorably impressed with the idea as published in *The Iron Age*, our later information leads us to believe that the establishment of the American Pig Iron Storage Warrant Company will be a decided benefit to the producers, in that it will enable them to hold their iron

for a fair price; and to the consumer, in that its tendency will be to relieve the market of violent fluctuations and thereby enable them to hold to a more uniform and satisfactory price for their finished work. The commission merchants will meantime, doubtless, continue to sell to consumers largely on the old basis to which the listing of warrants will be no bar. We understand that the warrant company is an established fact, and believe that the commission merchants who first realize it, and take advantage of the new system, will get the most benefit out of it.

A prominent member of the trade writes:

I cannot see that the interests of the business of the commission houses will suffer by the introduction of warrants, as they will probably be of 100 tons each, and many furnaces will require their aid to dispose of the warrants, and want loans on them.

Stroud & Co., of New York, write:

The effect upon the business interests of commission merchants of a successful introduction of pig iron warrants as a speculative medium would so largely depend upon circumstances that it is hard to say at this time what the result would be. The effect upon the business of the pig iron furnaces is more apparent, and in our opinion it would prove detrimental. One of the arguments used in favor of the scheme is our chief argument against it—the accumulation of a large stock, which, in our judgment, would be a constant menace to the market. It would be held largely by speculators, who would regulate the price of iron according to their own sweet wills instead of in the interest of the iron manufacturers. The only furnaces which would profit by it would be those whose owners cannot well afford to "blow out," and these are the very men who in times of depression would go on adding to the already large stock on hand, instead of being compelled, by the operation of the natural laws of trade, to stop work or reduce their output.

An increase in the stock of pig iron would always be a signal for a raid upon the market by the speculative "bears," and should favorable conditions appear on the commercial horizon it would be the speculative "bulls" who would reap the benefit in nearly every instance, and not the furnaces. In short, while such a scheme would certainly enable the furnaces to obtain financial aid at times when they need it, we claim that that advantage is more than offset by the undoubted facts that it would be the means of increasing the production, thereby increasing competition, which with the constant menace to the market of a large stock on hand would enable the operators in warrants to cut down the profits of the furnaces. It must be borne in mind that when a furnace sells its iron to a speculator it thereby creates a competitor in the market for the sale of its own iron.

One of the oldest firms in the business writes:

We observe in *The Iron Age* the programme of the specious Pig Iron Warrant Association or company, apparently supported by many ornamental names, sprinkled here and there with a good many others with their own axes to grind. A very hazy, sentimental feeling seems to pervade the play-bill laid out for the public, and that some Dousterswind process is all that is needed to better the condition of prices and prospects of Southern pig iron. According to Swank, there were only 350,000 tons of pig iron in stock in the United States, of which 112,000 tons were charcoal. The Southern furnaces could not expect an advance of over \$8 a ton at their own works when

they state confidently they can make it for \$9 and \$10 a ton. The great obstacle to the success of the scheme is that all pig iron is not of the same value; that the quality varies greatly, and the location of the iron will make a great difference in the market value of the iron. A furnace turns out Nos. 1, 2 and 3. The No. 1 is used for foundry purposes, Nos. 2 and 3 by mills to make bar iron. The iron founder does not buy the lower grades, and No. 1 is too expensive for the mill men. Iron, besides, has a different value at Birmingham, Louisville, St. Louis, Chicago, Pittsburgh, Philadelphia, and New York and Boston. The whole make-up of the scheme is like a body of brass and legs of clay; it will not stand close criticism, and the prospectus is like some pretty calicoes—nice to look at, but will not stand scouring. In our opinion, the company will not succeed until there are large stocks needing their assistance to finance. At present no change will take place by their operations. We would further add that the value of a warrant issued for iron of the kind we describe and at the places we name would not have a uniform value, and hence, we think, would not likely get on the Stock Exchange. Even the Iron and Metal Exchange in New York has been a complete failure, greatly from the causes above described, and no sales are now effected there.

PHILADELPHIA FIRMS

Contribute the following opinions:

We are inclined to the opinion that so far as the present relations exist between the consumers and commission men there will be no change. The question will at once arise whether it will be more advantageous for a consumer to purchase his requirements from a regularly constituted furnace agent or from a speculator. Were all brands of pig iron equally adapted for all purposes, the conditions might be somewhat changed. There might be an additional field opened in the sale of warrants on a brokerage. We do not apprehend that makers of standard brands will have any necessity to take advantage of the warrants, as those brands are always in demand in excess of the supply.

A leading concern writes:

So far as this firm is concerned, we do not think that the business of the American Pig Iron Storage Warrant Company will affect us in the least, as the furnace companies we represent will not take their business out of our hands. Several of the furnaces that we represent have been doing business for a long time on precisely this basis, and have the yard wherein the iron is stored leased to this firm, and from time to time, as their wants require it, we raise money on these storage-yard warrants. We think in a general way that the successful operation of this company will have a very beneficial effect upon the pig-iron business, as we hope that it will steady prices. As far as the speculative part of it is concerned, we hope not to see too much of it done, as we think it is a bad thing to have as solid an article as pig iron be a medium for speculation.

We shall in next week's issue of *The Iron Age* publish additional letters from producers, commission merchants, and from leading consumers.

The success of the open-hearth cast steel gun built by the Standard Steel Casting Company, of Thurlow, Pa., and tested last week by Government officials at Annapolis, Md., has revived some interest in the ill-fated Bessemer gun, made by the Pittsburgh Steel Casting Company, of Pittsburgh, which burst during the test-

ing at Annapolis some two months ago. In an interview on the subject of built up and cast guns, Mr. W. Hainsworth, superintendent of the Pittsburgh Steel Casting Company, expressed his views as follows: "I am glad that the Thurlow gun stood the test, and think that it will come out of the star-gauging test all right. When I undertook to turn out a Bessemer gun I understood that great elastic limit was necessary. The failure of the gun was due to the hardening of the breech, which caused internal grain. We tempered ours to give it greater elastic limit. The Thurlow gun was annealed, but not tempered, and they were wise to leave it in its natural state. Its success establishes the fact that a Bessemer gun can be made and stand a good test when properly annealed, but not tempered. We will not cast another gun now, but if the Government should issue proposals for steel cast guns we would be on hand."

OBITUARY.

CORNELIUS H. DELAMATER.

On Wednesday of last week the founder of the Delamater Iron Works died of pneumonia, at his residence in this city. Mr. Delamater was born at Rhinebeck Heights, N. Y., August 30, 1821. When he was three years old his parents moved to New York, where, at the age of 14, he entered the hardware house of Swords & Co. Two years later he entered the Phoenix Iron Works, where his father was cashier and confidential adviser. When 20 years old he formed a copartnership with Peter Hogg, under the firm name of Hogg & Delamater. This firm continued until 1857, when, Mr. Hogg retiring, the Delamater Iron Works were started on the site now occupied at the foot of Thirteenth street, this city. The unusual mechanical ability developed by Mr. Delamater made him an all-important factor in the establishment, which afterward increased with such wonderful rapidity. During the Rebellion he performed a very essential part, as it was through his large wealth and the great resources of his works that the Monitor and Dictator were built in so short a time. He also built the Iron Witch, the first iron steamboat that ever ran upon the Hudson. He contracted to build 30 Spanish gunboats in eight months, at a cost of \$60,000 each in gold, and although the insurgents interposed many serious obstacles by litigation in the courts, the boats were delivered in seven months from the date of the contract. The machinery for all the boats was built at his own works, in addition to all the regular work that was done. The hot-air engine of John Ericsson, as a substitute for steam, was first introduced in the Ericsson, which was built entirely by Mr. Delamater, by whom the incidental experiments were also conducted.

A list of the great undertakings in which Mr. Delamater was interested, and to the development of which he lent his thorough mechanical knowledge, would be simply an enumeration of the initiative work which the Delamater Iron Works have taken in aiding the advancement of practical mechanics during the past quarter of a century. Having quick perceptive faculties, and being familiar with the requirements, Mr. Delamater was enabled to instantly perceive the merits of an invention, and to closely estimate its financial, as well as mechanical, prospects, and having once enlisted his energies, he knew no discouragement. This characteristic made the works the harbor for those seeking the aid to be obtained from the all-powerful combination of brains and capital. Personally Mr. Delamater was exceptionally popular with his men, as

was shown during the draft riots, when the mob refused to burn his works. As one of the Commissioners of Rapid Transit in this city, in 1876 and 1877, he foresaw what the city needed, and to-day the public are reaping the comforts and pleasures of an elevated railroad system of great value. By the articles of copartnership it is agreed that the works shall be continued by the survivor six months after the decease of his associate, and under this stipulation the entire establishment will be conducted by William Delamater, as the survivor of the firm.

Washington News.

(From Our Regular Correspondent.)

WASHINGTON, D. C., February 12, 1889

In order to simplify methods of steel inspection under Government auspices to lessen cost and relieve officers at the establishments filling steel contracts the Secretary of the Navy issued the following instructions:

NAVY DEPARTMENT, WASHINGTON, {
February 6, 1889.

Gentlemen: The present method of conducting inspection requires a large force of officers, likely to be much increased as the work increases, and assumes that the Department is to witness and approve of the process of manufacture in the various steel works where the shipbuilders shall place contracts.

The experience already had by the manufacturers should make it possible for them to know, through their own experts, the characteristics of their daily product, and the Department deems that the time has come when it is wise to withdraw largely their men from the works, and leave the responsibility upon the manufacturers, and transfer its testing to the shipyards, and there test the finished material as it is received, and accept or reject as the results may justify.

This matter requires consideration, and a consultation will be had at this Department at 1 p. m. on Tuesday, February 12, 1889, for the purpose of considering and discussing the subject as to the more satisfactory and economical place or places—the manufacturers' works, shipbuilding yards, or both—to conduct the several required inspections of steel materials to be used in the construction of United States vessels, and you are asked to send a representative from your works to confer with the Chief Constructor, the Engineer in Chief, the President of Steel Inspection Board and representatives from shipbuilding yards and steel-makers.

Very respectfully,

W. C. WHITNEY, Secretary of the Navy.

In pursuance of this circular letter, at 1 o'clock to-day the following officers and others assembled at the office of the Steel Inspection Board:

Chief Constructor U. S. Navy, T. D. Wilson (in the chair); Engineer-in-Chief U. S. Navy, George W. Melville; Capt. H. L. Howison, U. S. Navy, president of Steel Inspection Board; R. W. Davenport, Lieut. W. H. Jaques, representing Bethlehem Iron Company; Axel Petrie, representing Midvale Steel Company; William Taylor, of the Spang Steel Works, Pittsburgh; N. F. Palmer, Quintard Works, New York; Chas. Cramp, of the William Cramp & Sons S. & E. B. Company; Mr. Wetherell, Standard Steel Casting Company; Cephus Taylor, Linden Steel Company; Mr. Rowland, Continental Iron Works.

The conference lasted several hours. The gentlemen of the board heard the suggestions offered. They will hold a meeting in a few days to go over the mass of matter and formulate their recommendation in a report to the Secretary of the Navy.

Within the lines laid down in his circular letter the disposition of the officers is to make important changes in this branch. The manufacturers are well satisfied to have matters remain as they are. It is possible that a compromise plan will be recommended which will continue certain work at the works and other portions at the yards.

TRADE REPORT.

Chicago.

Office of *The Iron Age*, 95 and 97 Washington street, CHICAGO, February 11, 1889.

Pig Iron.—While the market can hardly be called active, it seems to be gradually approaching that condition. The number of buyers is increasing, and although the demand is mainly for small lots the aggregate forms quite a respectable volume of business. Occasionally a consumer is found with sufficient confidence in the future to provide for his wants for a few months. Several transactions of that character have occurred during the week, ranging from 500 to 1000 tons each. For some of these large orders there was a vigorous competition among local manufacturers, and \$16 for No. 1 Foundry was shaded. The Calumet, Bay View and Mayville furnaces are again in almost complete control of this market in supplying Pig Iron for general purposes, and the Calumet is also making a high-grade Soft Iron branded "Chicago Scotch" which is displacing Ohio Soft Irons. Prices are as weak and unsettled as they have been, with no indication of an early improvement in this respect. Notwithstanding the low prices now prevailing, manufacturers are keeping their furnaces in blast with remarkable tenacity, each probably hoping that some of his competitors may be tired out first. The furnaces thus far blown out in this immediate vicinity have been making Bessemer Iron, and not Iron for the general trade. The Ohio failure which occurred on Saturday was unexpected, as the company was believed to be financially strong. Perhaps the restriction of production so necessary to the recovery of the health of the Iron trade will after all only be brought about in this unpleasant way, by the weeding out of weak concerns. The opinion is freely expressed that the present depression in Pig Iron is another of the inevitable movements toward the permanent establishment of a lower level of prices in this country, and that when an improvement comes our enormous furnace capacity will prevent a return to the best prices of the last period of activity. Prices of Lake Superior Charcoal are apparently as firm as they have been, moderate sales being reported during the week. Cash quotations are as follows, f.o.b. Chicago: Lake Superior Charcoal, Nos. 1, 2 and 3, \$20; Lake Superior Coke, No. 1, \$16 @ \$17; No. 2, \$15 @ \$16; No. 3, \$14 @ \$15; American Scotch (Blackband), No. 1, \$18.50 @ \$19.50; Jackson County Silvery, No. 1, \$18; other Ohio Soft Irons, No. 1, \$17 @ \$18; Chicago Scotch, No. 1, \$17.50; Southern Coke, No. 1 Foundry, \$16 @ \$16.50; No. 2 Foundry and No. 1 Soft, \$15.25 @ \$15.75; No. 3 Foundry, \$15; Gray Forge and No. 2 Soft, \$14 @ \$14.50.

Bar Iron.—The condition of this branch of trade is about the same as was reported last week. Orders are scarce and prices are nominal at 1.70¢, half-extras, f.o.b. Chicago, for carload lots of good quality Common Iron. Good specifications have been placed at 1.65¢, but thus far this is believed to have been the bottom price made by standard mills. Small lots are selling from store all the way from 1.85¢ to 2.10¢, according to quantity and quality.

Structural Iron.—A few advance orders have been placed for Beams for building purposes, but in other respects very little is doing. Mill lots are quoted as follows, f.o.b. Chicago: Angles and Sheared Plates, 2.12¢ @ 2.15¢; Universal Plates, 2.20¢; Tees, 2.45¢ @ 2.55¢; Beams and Channels, 2.90¢; Store lots are sold

at 2.35¢ for Angles; 2.70¢ for Tees, and 3¢ @ 3.4¢ for Beams and Channels.

Plates, Tubes, &c.—Although large contracts for Plates were less numerous than in the previous week, the general condition of trade was somewhat improved. The boiler-makers are receiving good orders and are free buyers of Plates. Prices are unchanged, small lots from store being quoted at the following rates: Sheet Iron, Nos. 10 to 14, 2.50¢; Sheet Steel, 3¢ @ 3.50¢; Tank Iron, 2.40¢; Tank Steel, 2.60¢ @ 2.75¢; Shell Iron, 3¢; Shell Steel, 3.12¢; Flange Iron, 4¢; Flange Steel, 3.50¢; Fire-Box Steel, 4.75¢ @ 5.75¢; Boiler Rivets, 4¢ @ 4.25¢; Ulster Iron, 3.75¢; Boiler Tubes, 62½¢ @ 65¢ off.

Sheet Iron.—The demand for Galvanized is spasmodic, but even yet stocks in warehouses here are not up to the usual standard. Quotations for small lots are unchanged, at 65¢ off for Juniata and 65¢ and 2½¢ off for Charcoal. Black Sheets are quiet and unchanged, at 3.30¢ for No. 27 Common from store, and 2.95¢ @ 3¢, f.o.b. Chicago, for mill lots.

Merchant Steel.—An order for a good quantity of Open-Hearth Spring Steel was placed at quite a low price, and Tire Steel has also been purchased at very low rates. Trade has been mostly confined to small lots, however, for which full prices are obtained. We quote as follows: Soft Steel Bars, 2.10 @ 2.30¢; Tool Steel, 7.75¢ @ 8¢; Specials, 13¢ @ 25¢; Crucible Spring, 3.75¢; Open-Hearth Spring, 2.20¢ @ 2.50¢; Open-Hearth Machinery, 2.30¢ @ 2.50¢; Tire, 2.20¢ @ 2.50¢; Sheet, 7¢ @ 10¢.

Steel Rails.—The sales of the week amounted to about 10,000 tons. Other orders are in sight which will soon be placed. Prices are maintained at \$30 @ \$30.50, according to quantity. The Western manufacturers are deeply interested in the competition now being waged between the Eastern and Pittsburgh manufacturers over Southern business. It is to be hoped that this section, having had its taste of demoralization, will not become involved in the trouble. The Joliet Steel Works have shut down for a few weeks for repairs, which leaves the North Chicago Rolling Mill Company the only active concern here at present.

Old Rails and Wheels.—Sales of Old Iron Rails have been made at points in the interior of the State at \$20.50 @ \$21, and holders insist that they are worth the same price here. On the basis of transactions for deliveries elsewhere, however, it is difficult to figure above \$19.75. Old Steel Rails have been sold in small quantities at \$15 for lengths under 3 feet and \$18.50 for long lengths. Old Car Wheels are dull and are quoted nominally at \$19.

Scrap.—The supply is very abundant, the demand is very limited and most dealers are not attempting to push sales. Quotations to consumers are about as follows, per ton of 2000 lb: No. 1 Railroad Shop, \$20; Track, \$18; No. 1 Mill, \$13 @ \$14; Pipes and Tubes, \$18; No. 2 Mill, \$9; Axles, \$25.50; Horseshoes, \$18; Machinery Cast, \$13 @ \$14; Stove Plate, \$9; Cast Borings, \$8; Wrought Turnings, \$10.50 @ \$11; Coil and Leaf Steel, \$14.50; Mixed Steel, \$10. Dealers are giving \$14 for Mixed Country Scrap.

General Hardware.—The volume of business in Shelf Hardware is not so great as it was in January, some houses reporting a decided falling off in orders. Other establishments, however, continue to be very busy for the season, and consider their prospects bright for a good month's trade. Several large buyers from remote western points have been in the city the past week, and have placed good orders for Hardware, including considerable

quantities of Cutlery. The houses which have been making special efforts of late to build up their Cutlery trade are meeting with very encouraging success, and are intercepting business which until quite recently went East or abroad. Heavy Hardware is in good demand, but only in certain localities, some districts tributary to this market buying very little at present. The houses engaged in this line are carrying over to next season large stocks of Sleighs and materials for Sleighs, for which there has been no sale this winter owing to the lack of snow. Manufacturers' agents are now booking large orders for seasonable goods for future delivery. Copper Rivets and Burs have been advanced to 50¢ off.

Nails.—Manufacturers' agents are receiving numerous inquiries for Steel Nails, and are expecting a good demand shortly, as stocks in second hands are rapidly being reduced. Some orders of considerable size have been placed quietly within the past two weeks by parties who had been supposed to be well supplied, thus strengthening the position of the manufacturers very materially. Jobbers' prices are still the same as those quoted by manufacturers, carload lots being sold at \$2, and small lots at \$2.05. Wire Nails have not improved. Carload lots are selling at \$2.40, and small lots at \$2.45.

Barb Wire.—The demand is good but prices show no change, jobbers quoting 2.80¢ for Painted, and 3.40¢ for Galvanized in mixed carload lots, and 2.90¢ and 3.50¢, respectively, for small lots, with slightly lower rates to best buyers.

Pig Lead.—Prices are a shade lower, some 900 tons having been sold at 3.50¢. Higher values are looked for within 60 to 90 days, with the approach of spring trade and the increased consumption which will take place.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, Pa., February 12, 1889.

Pig Iron.—There is very little change to note as compared with the market a week ago. Prices are steady, with some degree of firmness, and while no one looks for much improvement, there is a somewhat general impression that bottom figures have been reached, for awhile at all events. The offerings are liberal at quoted rates, but it is doubtful if concessions could be obtained unless quality was more or less doubtful, or for other reasons not applicable in ordinary transactions. The demand is not of a very satisfactory character, however, consumers taking only such lots as are required within the next three or four weeks. This, of course, is a pretty safe guarantee of the demand being continuous, unless consumption falls off unexpectedly. This is a point upon which there is nothing definite to base predictions, although the trade hope, and profess to believe, it will come out all right in course of a few weeks. There is certainly no reason for a contrary opinion so far as now appears. Nevertheless it is useless to deny that want of confidence is probably the most prominent feature in the market. As an offset to this it may be said that values would easily respond to any favorable influences. Consumers could not buy more sparingly than they have done of late if they are going to run at all, and with the first sign of improvement carload orders would be increased to 50-ton lots, and so on all the way through. Everything depends, therefore, on the amount of business forthcoming within the next 30 or 60 days. As to the probable requirements of consumers, as we said before, there is no basis upon which to form decided opinions. A good deal of disappointment has been met with so far during

1889, and there may be still more before the market takes a right kind of a turn, but the trade are still hopeful that things will turn out favorably. Meanwhile prices have become steady at about \$15.25, delivered, for Gray Forge, \$17 for No. 2 Foundry and \$18 for No. 1. Special brands command from 50¢ to \$1 per ton beyond these prices, and are pretty well taken up at very near to outside figures. Southern Iron is not pressed for sale, although holders would probably shade a trifle on firm offers for good-sized lots. Asking prices are \$17, ex ship, for No. 1, \$16 for No. 2 and \$15 for Gray Forge, with no recent transactions reported.

Foreign Iron.—Bessemer quoted at \$19.50 @ \$20, c.i.f., duty paid, with no demand. Spiegeleisen is quoted \$28.50 for 20 %, with bids for round lots at \$28, same terms.

Blooms.—A fair business is doing at somewhat irregular prices, although quotations are ordinarily about \$28 @ \$28.50 at mill for Nail Slabs; \$29 @ \$30 for Sheet Iron Billets; \$30 @ \$31 for Soft Tank, and \$35 @ \$36 for flange purposes; Charcoal Blooms, \$52 @ \$54; Run-out Anthracite, \$42 @ \$44; Scrap Blooms, \$32.50 @ \$34 per "bloom" ton of 2464 lb.

Muck Bars.—Business during the week has been done at \$27, delivered, but holders are inclined to stiffen up to \$27.50, with bids of \$27 declined within the past two or three days.

Bar Iron.—Nothing satisfactory can be said under this heading. The demand is said to be a trifle better in the interior, but prices show no improvement and can hardly be quoted with any degree of exactness. Of course there are all kinds of Iron, and there are all kinds of prices; the difficulty is to adjust the one to the other. Strictly first-class Bars are supposed to be worth 1.8¢ @ 1.85¢; some claim to offer them at a tenth less, while still others claim to offer a good Iron at 1.65¢ @ 1.70¢. Exact quotations, therefore, are simply impossible in times like these, although those whose product is beyond question are holding for 1.8¢ and upward, but a good deal depends on the kind of order that is placed before them. Skelp Iron is quiet, with sellers at 1.75¢ @ 1.80¢, but the demand appears to have been satisfied, as only small lots are being asked for at present.

Plate and Tank Iron.—A very dull market is reported in this department, and while there is undoubtedly a great deal of business to come on the market in the near future, the immediate position is most unsatisfactory. Prices are irregular, although they can hardly be called lower, as orders are not large enough to make concessions worth while. New business is anxiously looked for, however, and to secure something very desirable prices might possibly be shaded from asking rates, which are as follows: 1.90¢ @ 2¢ for Ordinary Plates and Tank Plates, 2.1¢ @ 2.2¢ for Universal Plates; Shell, 2.4¢ @ 2.5¢; Flange, 3.5¢; Fire-Box, 4¢; Steel Plates, Tank and Ship Plate, 2.15¢ @ 2.25¢; Shell, 2.7¢; Flange, 3¢ @ 3½¢; Fire-Box, 3½¢ @ 4½¢.

Structural Iron.—Although there is no improvement to note in this department, the feeling is hopeful because of the large amount of business which is certain to come on the market in course of a short time. It may come within a couple of weeks, or it may be postponed until next month, but that it will come soon is certain, hence there is less despondency than might be expected after such a protracted period of depression. Prices remain as before, viz: Bridge Plate, 2¢ @ 2.1¢; Angles, 2¢ @ 2.1¢; Tees, 2.4¢ @ 2.6¢; Beams and Channels, 2.8¢ for Iron or Steel.

Sheet Iron.—There is a fair demand for small lots, and prices remain as last quoted—viz.:

Best Refined, Nos. 26, 27 and 28.... 8 @ 3½¢
Best Refined, Nos. 18 to 25.... 2½ @ 3 ¢
Common, ¼¢ less than the above.
Best Bloom Sheets, Nos. 26 to 28.... 4½ @ 4½¢
Best Bloom Sheets, Nos. 23 to 25.... 3½ @ 4 ¢
Best Bloom Sheets, Nos. 16 to 21.... 3½ @ 3½¢
Blue Annealed..... 2.6 @ 2.6¢
Best Bloom, Galvanized, discount..... 62½ ¢
Common, discount..... 67½ ¢

Steel Rails.—The weakness reported at Western mills does not appear to be participated in by those in the East. Prices are, to some extent, nominal, but makers claim that they would let business pass them rather than make concessions, although 5000-ton lots or upward might possibly be accepted at fractionally lower rates if deliveries and payments were especially satisfactory to sellers.

Old Rails.—The market is very quiet, and while holders are firm and prices nominally unchanged there is less disposition to pay the high prices asked—say, \$24 and upward for lots in store. Several lots have changed hands at from \$24 to \$24.50, delivered to mills near-by, with further demand at the inside figure.

Scrap Iron.—The market is very quiet and prices somewhat easier, unless for very choice lots. Quotations about as follows: \$20 @ \$20.50 for cargo lots; \$21 @ \$21.50 for carload lots, delivered, or for choice \$22; No. 2 do., \$14 @ \$15; Turnings, \$13 @ \$14; Old Steel Rails, \$20 @ \$21; Cast Scrap, \$15 @ \$16; do. Borings, \$9 @ \$10; Old Fish Plates, \$25 @ \$26; Old Car-Wheels, \$17 @ \$18, Philadelphia.

Wrought-Iron Pipe.—Business has been fairly active taking everything into consideration, and prices are unchanged. Orders for large lots are still felt to be near at hand, but for the present there is nothing more than the ordinary run of trade. Discounts as follows: Butt-Welded Black, 55 ¢; Lap-Welded Black, 65 ¢; Butt-Welded Galvanized, 45 ¢; Lap-Welded Galvanized, 55 ¢; Boiler Tubes, 62½ ¢.

Nails.—The feeling is a shade better, and cutting is less frequently met with, but the demand, as may be expected at this season, is quite light. Stocks decreasing, and some progress is being made in the effort to restrict production. Prices remain at from \$1.90 to \$2 for store lots.

Cincinnati.

Office of The Iron Age, Fourth and Main Sts., CINCINNATI, February 11, 1889.

Pig Iron.—An improved tone has prevailed in the local market during the week. The inquiries have been numerous, especially for Forge Iron, and there have been some sales of moment, but sellers have assumed a firmer attitude, and, demanding higher prices, have checked the increasing requests of consumers. Foundry Iron, too, has been held more firmly, but it has been less in demand from either speculators or consumers. For prompt delivery Iron of all kinds is obtainable at the close 50¢ @ \$1 per ton less than is asked for delivery embracing six months to a year. Purchasers for speculative account have been less successful than buyers for consumption, there existing a feeling against the former operators. Sales of Foundry Iron, while considerable in the aggregate, have been largely for small amounts. Sales of Forge Iron have consisted of Grey Forge, Mottled and Soft Irons, largely the product of Ohio furnaces. About 5000 tons of these grades have been sold, one lot of 2000 tons Southern Grey Forge selling at \$12.75, cash, and 500 tons ditto at \$13. No. 1 Southern Foundry has been offered at \$14.75, and same brands are obtainable at this rate at the close for immediate shipment, but most

sellers claim to ask \$15, and even more. The following are the approximate prices current here at the close for cash, f.o.b.:

Foundry.

Southern Coke, No. 1 (new classification).....	\$14.75 @ \$15.25
Southern Coke, No. 2 (new classification).....	14.25 @ 14.00
Southern Coke, No. 3 (new classification).....	13.75 @ 14.25
Ohio Soft Stone Coal, No. 1.....	15.00 @ 16.00
Ohio Soft Stone Coal, No. 2.....	14.50 @ 15.00
Mahoning and Shenango Valley.....	16.50 @ 17.00
Hanging Rock Charcoal, No. 1.....	21.00 @ 22.00
Hanging Rock Charcoal, No. 2.....	19.00 @ 22.00
Tennessee and Alabama Charcoal, No. 1.....	18.00 @ 18.50
Tennessee and Alabama Charcoal, No. 2.....	17.00 @ 18.00

Forge.

Strong Neutral Coke.....	18.00 @ 18.50
Mottled Neutral Coke.....	12.00 @ 12.25
Gray Forge.....	12.75 @ 13.25

Car-Wheel and Malleable Irons.

Southern Car-Wheel.....	20.00 @ 25.00
Hanging Rock, Cold Blast.....	22.00 @ 26.00
Lake Superior Car-Wheel and Malleable.....	21.00 @ 22.00

Manufactured Iron.—There has been a fair volume of business and a steady market, the change in prices being only in special instances.

Nails.—The demand has been fair and the market has remained steady, but the offerings are liberal. 12d @ 40d sell at \$1.90 @ \$1.95 per keg, with 10¢ rebate in carload lots at the mills. Steel Nails sell at \$1.90 @ \$1.95, and Steel Wire Nails at \$2.60 @ \$2.65 per keg.

Old Material.—The market has ruled heavy and lower prices have been accepted, Old Rails having sold as low as \$20, but other and lighter weight are held at \$21; Old Wheels have sold to a moderate extent at \$18, cash.

Cleveland.

CLEVELAND, February 11, 1889.

Iron Ore.—Ore dealers are endeavoring to induce furnacemen owning Ore now on the docks to accept new Ore in its place, the latter to be delivered in May. This would enable them to resell the Ore, disposed of at cheap figures last August and September, at an advance of about 40¢ per ton over the figures then obtained. Beyond the 10,000-ton transaction recorded last week there appears to have been no local sales of new Ore. The price obtained for this Ore—\$4.15 per ton for Non-Bessemer Menominee—seems likely, however, to furnish a basis for the establishment of permanent quotations. Several heavy purchasers have said to-day that the range of prices for all standard Ores will be from 25¢ to 40¢ above last season's opening prices. The 75,000 or 80,000 tons of new Ore already sold at Chicago, according to the information received by interested parties here, was at an average advance of 42¢ per ton over the prices at which the same Ores sold at the beginning of the season of 1888. Vessel rates have been somewhat demoralized by the fact that a line of vessels have been chartered to bring Ore from Ashland to Cleveland for \$1.25 per ton during the season. Rival lines claim that the amount of Ore to be carried by these vessels is small and that the Ore is intended to serve as ballast for other cargoes. These charters have had the effect, however, of upsetting the calculations of the lake carriers and will undoubtedly result in a schedule of rates based upon a charge of not over \$1.05 or \$1.10 at the most, from Escanaba to lower lake ports. Real activity in the Ore market is not looked for until there shall have been some improvement in the Pig-Iron situation, which just at present could not well be more lifeless and depressed. None of the large mining companies have thus far fixed prices, although there is very little question as to what these quotations will be.

Pig Iron.—Beyond a limited inquiry for Foundry Iron the market is without life. Such widely varying reports are in circulation regarding concessions by the furnacemen that no authoritative information as to quotations can be given. Small lots of Bessemer Iron are known to have been sold at liberal sacrifices, but sellers generally take a more hopeful view of the outlook. Several local furnaces are expected to go out of blast, temporarily, within the next ten days.

Manufactured Iron.—Several mills have stopped running, and only small and widely scattering sales are reported.

Old Rails.—Sales of Old American Rails, in small lots, are reported at \$22.50 @ \$22.75.

Nails.—Steel Wire Nails at \$2.40 are very firm, as are also Common Steel Nails at \$2.

It is reported at the office of the Chapin Mining Company that about three-fourths of the stock in the Chapin Mine has been sold to Ferdinand Slessinger, of Milwaukee, associated with certain New York capitalists, for \$2,000,000. The sale does not disturb the lease, which has 30 years to run. Nearly all of the stock not purchased by Mr. Slessinger is owned in this city. The Chapin Mine produced last year about 250,000 tons of Ore. The Ore sold at the beginning of last season at \$5, dropped at one time in the autumn to \$4.50 @ \$4.75, and closed at about \$5.25.

St. Louis.

Office of *The Iron Age*, 212 N. Sixth st.,
St. Louis, February 11, 1889.

Pig Iron.—The general conditions remain unchanged. The views expressed by the representatives of some of the leading furnaces that the recent large purchases would have the effect of strengthening the market seem to have been somewhat premature. While the general opinion prevails among those interested in the Iron trade that the market has about reached bottom and an upward turn may be looked for, yet, for some unknown reason, the expected improvement fails to materialize. A number of furnaces have advanced their prices from 50¢ to \$1 per ton, but their object in so doing was to emphasize the fact of their withdrawal from the market at present prices, and the advanced figures are consequently purely nominal. Inquiries are coming in from large consumers, but reported sales are generally for small lots for prompt delivery, which gives the market more or less of a hand-to-mouth character. Prices for such lots for cash, f.o.b. St. Louis, are as follows:

Southern Coke, No. 1 Foundry, \$15.25 @ \$15.75
Southern Coke, No. 2 Foundry, 15.00 @ 15.25
Southern Coke, No. 3 Foundry, 14.25 @ 14.75
Gray Forge, 13.50 @ 13.75
Ohio Softeners, 17.50 @ 20.00
Lake Superior Charcoal, 21.00 @ 21.50

Missouri.

Charcoal Foundry, No. 1, 16.00 @ 16.50
Charcoal Foundry, No. 2, 15.00 @ 15.50

Tennessee.

Charcoal Foundry, No. 1, 17.50 @ 18.50
Charcoal Foundry, No. 2, 16.75 @ 17.50

Connsville Coke, f.o.b. East St. Louis, \$4.70; St. Louis, \$4.85.

Bar Iron.—The mills continue to be kept pretty well employed on orders received from country merchants, who are stocking up preparatory to the spring trade. Prices are weak and sensitive, and low figures are accepted on desirable specifications. Carload lots from mill are quoted at 1.80¢, and lots from store at from 1.85¢ to 1.95¢, according to quantity and quality.

Barb Wire.—There is no perceptible change in this line. Mills are all busy,

and in some cases are running behind on their orders, but prices continue weak and unsettled. There is no basis for ascertaining exact quotations, as each individual mill is making its own. It seems probable, however, that an advance will have to be made shortly, as manufacturers claim there is no inducement in present prices for them to keep their plants in operation, and say it would be more profitable to close down rather than continue selling at the figures now ruling, which remain as last quoted: Carload lots, Two and Four Point Painted, \$2.90; carload lots, Two and Four Point Galvanized, \$3.50, f.o.b. St. Louis; less than carload lots, 5¢ additional.

Birmingham.

BIRMINGHAM, ALA., February 11, 1889.

Notwithstanding the continued depression in Iron generally, the past week has developed encouraging features for the near future in the financial situation. Bankers are more cheerful than they have been for 12 months. A great deal of cash has come into circulation here by means of the sale of several lots of stocks in gold mining companies in East Alabama. So much, indeed, has come from this source that it is regarded as a harbinger of a revival of the flush times which prevailed here several years ago. Though prices in Iron are lower than ever known in this district operations are going along steadily, and a number of the larger plants are preparing to increase their capacity for production. Notable among these is the Eureka Company, of Oxmoor, who will, it is reliably reported, begin within the next month the erection of two 125-ton furnaces. Another new furnace, the building of which will begin next month, is at Bessemer, by the De Bardeleben Coal and Iron Company. In addition to this there are six new furnaces now building in the district. A close calculation shows that, with what there is now in course of erection in this city, by early spring there will be \$1,500,000 worth of building going on. This with the recent renewed inquiry for centrally located real estate largely mitigates the depressing influence of the state of the Iron market. Among the recent enterprises set on foot by the Birmingham people, who, by the way, have not confined themselves to operations immediately at home, is the Benton Land and Iron Company, a corporation just formed at Cleveland, Tenn., for the development of a deposit of Brown Iron Ore averaging 55 % of Metallic Iron and a minimum of 85 feet thickness. The remarkable thing about this Ore deposit is that is one of the rare instances of stratified brown Ore in this country. The enlarged Williamson Furnace here went into blast recently and is now in satisfactory operation. Though only one of the five Sheffield furnaces is running, it is intended soon to blow in the other four, a sufficient supply of Ore having been secured for their consumption.

The Henderson Steel Works went out of blast on Saturday, in order, it is given out, to enlarge the plant, which has been making a daily output of about 6 tons of good quality Steel. Foundries and machine shops keep full of orders and seem to have all they can do for some time ahead.

A rumor has it that Mr. Andrew Carnegie, who was here the latter part of the week with a number of railroad celebrities, making a tour of the South, has bought a large body of Ores, and that he designs, with local capitalists, to test the Ore for Steel properties. Mr. Carnegie, at a dinner given the visitors, expressed himself as greatly surprised both at the solidity of the various enterprises and at the vastness of the resources.

Louisville.

LOUISVILLE, KY., February 11, 1889.

Pig Iron.—The market continues in an unsatisfactory condition, the price of Iron being very low. We have not heard of offerings being made, however, on a lower basis than that reported for the last two weeks. Several of the furnaces that have made sales at bottom figures have withdrawn from the market, having sold what Iron they cared to place for the next 60 days, so that the market has a chance to slightly recover. It is hoped that a different tone will be manifest before the principal sellers in the last decline feel it wise to go on the market again to sell their product. Current quotations:

Southern Coke, No. 1 Foundry, new classification, \$14.75 @ \$15.25
Southern Coke, No. 2 Foundry, new classification, 14.25 @ 14.75
Southern Coke, No. 3 Foundry, new classification, 13.75 @ 14.25
Gray Forge, 13.25 @ 13.75
White and Mottled, different grades, 12.75 @ 13.25
Silver Gray, different grades, 12.00 @ 12.50
Southern Charcoal, No. 1 Foundry, 14.25 @ 14.75
" " No. 1 Mill, 14.75 @ 15.25
Southern Car-Wheel, standard brands, 21.75 @ 22.75
Southern Car-Wheel, other brands, 18.00 @ 19.50
Hanging Rock Coke, No. 1 Foundry, 15.50 @ 16.00
Hanging Rock Charcoal, No. 1 Foundry, 19.50 @ 21.00
Hanging Rock, Cold Blast, 20.75 @ 22.75

C. J. Kent and T. N. Mordue, of the late firm of Kent & Mordue, and Graham Macfarlane, late receiver of the Breckenridge Cannel Coal Company, have formed a copartnership for the purpose of conducting a general Iron, Coal and Coke business. They have recently opened a general Coal and Iron yard in Louisville, They are prepared to furnish storage for Pig Iron and other similar material, and issue warehouse receipts for the same. They are owners of the output of some of the best Cannel Coal mines, and will also handle Connellsville and West Virginia Coke, New River Smithing Coal and the best grades of Anthracite and Jellico Coal.

Chattanooga.

Office of *The Iron Age*, Carter and 9th Sts.,
CHATTANOOGA, February 11, 1889.

Pig Iron.—There is a very perceptibly bitter feeling prevailing among producers upon the subject of prices, but otherwise the situation is but little removed from that of our last report. It is notable that some of the companies are sold far ahead (one company as much as 100,000 tons), and, consequently, out of the market for some time to come. The storage system appears to be universally popular, and has had its influence in restoring confidence in the future, and the furnaces are much more indifferent about making and accepting offers than they were a few weeks ago; hence it seems very easy to see the reason why a bitter feeling prevails through the producing districts. There has been no further concession in prices, and there are many cases where offers have been made that were refused that would have been accepted a short time ago. One furnace, three days ago, refused 2000 tons No. 2 at \$12.50 at furnace bank, to be delivered from April to July, although they would have taken it for immediate delivery on spot cash. Many producers are firmly of the opinion that prices will advance within the next 30 to 50 days at least 50 cents to \$1 per ton, and there are many conditions existing that would seem to justify this opinion.

Miscellaneous.—A recent trip through Alabama and parts of Georgia has developed the facts beyond controversy that the present year will see many more new manufacturing enterprises started up and completed than any year in the past. We do not refer particularly to blast furnaces,

of which there are a few in course of construction, but rather to minor manufacturing, many of which will be put up with a view of utilizing the products of our furnaces and cognate articles.

Pittsburgh.

Office of *The Iron Age*, 77 Fourth Ave.,
Pittsburgh, February 12, 1889.

River navigation has been suspended for over a week, but, as the winter season is pretty well advanced, it will probably be resumed before long.

Pig Iron.—The market continues unsettled. It is contended by some operators, who are giving the market a good deal of attention, that if prices go much lower a general shut-down of all the furnaces in the Pittsburgh district for 30 or 60 days would have a good effect. Prices have further declined, and it is the belief of many that they have about reached bottom. We quote as follows:

Neutral Gray Forge.....	\$14.25 @ \$14.50, cash.
All Ore Mill.....	15.25 @ 15.50, "
White and Mottled.....	13.50 @ 14.00, "
No. 1 Foundry.....	16.50 @ 16.75, "
No. 2 Foundry.....	15.75 @ 16.00, "
No. 3 Foundry.....	14.75 @ 15.00, "
Charcoal Foundry.....	20.00 @ 24.00, "
Cold Blast Charcoal.....	24.00 @ 27.00, "
Bessemer Iron.....	16.25 @ 16.50, "

Included in the sales reported for the week were 1500 tons Gray Forge at \$14.50, cash; 1750 tons Bessemer at \$16.50, cash, and 700 tons Southern Cold Blast Charcoal at \$24.7, cash.

Muck Bar.—Continues very dull and prices are weak, offering freely at \$27, and sales, it is said, have been made as low as \$26.75, cash. Some large contracts for delivery this month have been repudiated by the buyers on the ground that the quality was not up to specifications; but it is intimated that if the market had gone the other way there would have been no trouble, so far, at least, as the buyers were concerned.

Spiegel.—Small sales of Spiegel, 20 %, at \$28.50 @ \$29, and Ferromanganese, 80 %, at \$56 @ \$56.50.

Manufactured Iron.—The demand for all kinds of Manufactured Iron continues light, and as long as there is a possibility of prices going still lower buyers will hold off. Once the market becomes settled there will no doubt be a considerably improved trade, as stocks, both in the hands of jobbers and large consumers, are known to be light and will soon have to be replenished. Prices continue weak, in sympathy with the raw article. Bars, 1.75¢ @ 1.80¢; Plates, 2.15¢ @ 2.20¢; No. 24 Sheet, 2.80¢ @ 2.85¢, all 60 days, 2 % off for cash. Skelp Iron, 1.75¢ @ 1.80¢ for Grooved, and 1.95¢ @ 2¢ for Sheared. There is a fair business in Skelp this year, but prices continue unsatisfactory.

Nails.—There is little or no change to note in the Nail trade here; there is little or nothing doing, and there is not likely to be much, if any, improvement in the demand here.

Wrought Iron Pipe.—There is a very fair business for this season of the year, when it is usually dull, but there is continued complaint in regard to prices, which are very irregular and unsatisfactory, and until there is an improved demand it is not likely that prices will stiffen up much. We continue to give discounts on large lines as a week ago: on Black Butt-Welded Pipe, 55 and 5 % @ 57 %; on Galvanized do., 50 and 5 %; on Black Lap-Welded, 65 % @ 67½ %; on Galvanized do., 55 and 2½ %; 2-inch Tubing, 11¢ @ 12¢ per foot, net; 5½-inch Casing, 35¢ per foot, net; Boiler Tubes, 65 % off regular list.

Old Rails.—Continue dull, but prices remain about as quoted a week ago, \$23.50 @ \$24 for American Tees. It is the belief of well-informed operators that the

lowest point has been reached, and that as soon as the demand sets in there will be an advance. Rails are worth as much at the seaboard as they are here, and they are higher across the water than at New York, and while this is the case the importations will continue light; moreover, the severe weather of the past week has suspended the work of lifting Rails, and besides the supply in this country is steadily growing less every year and the time is not far distant when Old Iron Rails will be a thing of the past, as there are no new ones being made and have not been for several years past. Old Steel Rails are quoted at \$18 @ \$18.50 for short and \$20 @ \$20.50 for long lengths.

Steel Rails.—Manufacturers continue to quote at \$28, cash, but that means for small lots; large blocks can be bought for a good deal less; but whether the reports from the East are true, that sales have been made here as low as or equal to \$26, we are not prepared to state. It is evident, however, that the mills are all anxious for business.

Billets.—Bessemer-Steel Billets are still quoted at \$28, cash, at which price a sale of 5000 tons of 4-inch was reported. Nail Slabs dull and nominal at \$27.50. Domestic Bloom Ends nominal at \$18, and Crop Ends at \$18.50, cash.

Railway Track Supplies.—Spikes unchanged at 2.05 @ 2.10¢, 30 days, on cars here: Track Bolts, 2.75¢, with Square and 2.85¢ with Hexagon Nuts; Splice Bars, 1.75¢ @ 1.80¢.

Old Material.—The demand continues light and prices weak. No. 1 Wrought Scrap, \$20 @ \$20.50, net ton; Wrought Turnings, \$13 @ \$13.50; Car Axles, \$24.50 @ \$25; Cast Scrap, \$14.50 @ \$15, gross; Cast Borings, \$11 @ \$12; Old Car Wheels, \$19.

New York.

Office of *The Iron Age*, 66 and 68 Duane street,
New York, February 13, 1889.

American Pig.—The Thomas Iron Company report having booked orders from regular customers aggregating 140,000 tons. Of this, 65,500 tons are reported to be No. 2 Plain Foundry and Gray Forge, at \$15.30, the balance being Foundry Iron. The company quote No. 1 Foundry, \$18, and No. 2, \$17. It is, of course, pretty generally understood that the company will protect their trade during the time of the delivery. What effect the figures now named by the Thomas Iron Company will have upon other sellers, North and South, remains to be seen. The cutting lately has not by any means come from Southern producers alone, No. 2 Northern having been offered close to \$16, and also No. 1 at \$17.50, and less. It is possible that this was done in anticipation of an announcement of \$17 and \$16 as the opening price, and as the result of rumors that sales for season delivery had been made at those figures. We quote standard brands, nominally, \$17.50 @ \$18 for No. 1 Foundry, \$16.50 @ \$17 for No. 2 Foundry, and \$15.25 @ \$15.50 for Gray Forge, all at tidewater.

Scotch Pig.—We quote: Coltness, \$20.50 @ \$21; Shotts, \$20 @ \$20.50; Langloan, \$20 @ \$20.25; Summerlee, \$20.25 @ \$20.50 and Dalmellington, \$19.25 @ \$19.50.

Plates.—We quote Iron Tank, 2¢ @ 2.2¢; Shell, 2.25¢ @ 2.4¢; Steel Tank and Ship Plate, 2.15¢ @ 2.25¢; Shell, 2.35¢ @ 2.5¢; Flange, 2.6¢ @ 2.75¢, and Fire-box, 3½¢ @ 4¢.

Structural Iron.—We quote Sheared Plates, 1.9¢ @ 2¢; Universal Mill Plates, 2¢ @ 2.1¢; Angles, 2¢ @ 2.10¢; Tees, 2.4¢ @ 2.6¢, and Channels and Beams, 2.8¢ on dock for all sizes.

Bar Iron.—We quote: Carload lots on dock, half extras, Common, 1.65¢ @ 1.75¢; Medium, 1.75¢ @ 1.8¢, and Refined, 1.8¢ @ 2¢.

Steel Rails.—We note sales of Eastern mills aggregating about 20,000 tons, chiefly for Southern delivery, at private terms, among which is one lot of 7000 tons for delivery at Emporium, Pa. It is understood that some of the sales have been made by a mill which has now practically filled its allotment, and has for the present withdrawn from the market. From the West comes the report that an Ohio mill has closed for about 8500 tons with Ohio roads, these orders having been in the market last year, and involving a "deal" for the delivery of coal to the mill in question. The situation is still unsettled, and \$27 @ \$27.50 remain nominal quotations at Eastern mill. The report of the Board of Control for February 1 has not yet been issued.

Tool Steel.—The market continues demoralized, and tempting concessions are made to large buyers, both in the way of low base prices and in cuts on extras.

Wire Rods.—No business is reported in foreign Rods, which remain nominally \$42 @ \$42.50. The position of Eastern Wire drawers, under the circumstances, is very difficult, taking into account the low prices on their products.

Old Rails.—We note sales aggregating about 1500 tons of Tees, from American roads, at a price equivalent to \$23.50, on cars at Jersey City. We hear of a sale also of 1000 tons of Tees, delivered in Western Pennsylvania, at \$24.50.

Track Material.—We quote Spikes \$2 @ \$2.10, according to quantity, and Angle Bars 1.80¢ @ 1.85¢, delivered. Of the latter, a round order for a 15,000-ton lot of Rails was placed this week with a Western mill.

Metal Market.

Copper.—Since our last week's report spot Chili Bars and Good Merchantable gave way from £77. 15/ to £79. 10/ this morning, and futures from £77 to £75; sales 1200 tons. The market here has meanwhile been stagnant at nominally 16¼¢ for Lake and 15¼¢ @ 16¢ for casting brands. Early in the week it was again reported that the Anaconda Mine is to receive \$300,000 monthly from the syndicate for remaining idle this year. There have again been afloat both in London and here some conflicting rumors with reference to the position of the syndicate. One of them was that the management was to be transferred from Mr. Secrétan to other members, his course of action lately not meeting with the full approval of the other parties interested. Another rumor asserted that the Lake Superior mines had, so far, declined to accede to the condition made them of curtailing production. The import of American Copper into Liverpool and Swansea for January has been 2728 tons Fine, as compared with 2529 same month last year. The export of Ingot Copper from the United States last year has been 31,664,046 lb, of ingot against 12,847,507 in 1887. The 11 active producing Lake Superior Copper mines turned out last month a total of 4564 tons of mineral, against 3686 tons by eight mines in January, 1888, and 4562 tons by the same 11 mines in December. The January output is equal to about 6,330,000 lb of fine Copper. The closing quotations this morning were 16¼¢ @ 16½¢ for Lake Copper. We print elsewhere the preliminary statistics of the U. S. Geological Survey.

Tin.—At the time we wrote our last report spot Tin was still worth in the London market £97, but has declined since to £94. 12/6 yesterday, while futures gave

way from £97. 15 to £97. 7/6, the sales aggregating 1000 tons. In this market 50 tons February were sold at 21½¢ @ 21¼¢, but later on the market became demoralized, 20 tons March being forced off at 21.10¢, 10 tons April at 21.20¢, and 40 tons May from 21.40¢ down to 21.20¢, the market winding up at 21.10¢ @ 21.30¢ for spot, February and March. The decline is said to have been due in the London market to the heavier shipments from the Straits. The actual shipments from the Straits to the United States in January amounted to 550 tons, as compared with 400 tons same month last year; to England they were 1200 tons, against 3500. The import of Tin into the United States in 1888 was 84,294,185 lb, against 25,334,533 lb in 1887, the re-export being only 123,952 lb, against 308,660 lb. This morning the London quotation is £94. 15/ for spot and £95. 10/ for futures. The spot quotation this morning in our own market is 21½¢. **Tin Plates.**—Our market has been dull and rather weaker, owing chiefly to the marked decline in Pig Tin. We quote, large lines, per box: Siemens-Martin Steel, Charcoal Finish, \$4.75 @ \$5.50; Ternes \$4.12½ @ \$4.25; Coke Tins, \$4.22½ @ \$4.30, and Wasters \$4.12½ @ \$4.15. The import of Tin Plates into the United States in 1888 has been 667,281,988 lb, as compared with 685,792,760 lb in 1887, while the re-export did not exceed 815,318 lb, against 1,080,515 lb in 1887. Liverpool quotes Coke Tins 13/.

Lead.—The position of this metal has been so thoroughly undermined, unsettled and demoralized by what happened during the last quarter of 1888 in conjunction with stagnation in trade, large stocks overhanging the market and the enormous increase in production that it is difficult to sustain prices even at the comparatively low stage they have reached of 3.65¢ @ 3.60¢, at which some 1500 tons were sold in the open market since our last, those of the West being quiet at 3.45¢. Soft Spanish declined in London from £12. 17/6 to £12. 15/.

Spelter.—Only a moderate business has been transacted on the spot at 5¢, or a fraction less, for Common Domestic; still, however, sparingly offered and generally held with firmness here as well as out West, the supply being restricted and only waiting for the expected spring revival in the demand. From London Silesian is cabled £17. 12/6 this morning, while here this brand may be nominally quoted 5½¢ @ 5¼¢.

Antimony.—With a gradually improving London market, Hallett cannot be had for less than 11½¢, for Cookson under 13½¢, for which there remains an active demand with an extremely moderate supply.

New York Metal Exchange.

The following sales are reported:

FRIDAY, February 8.		
40 tons Tin, April.....	21.50¢	
48 tons Lead, March.....	3.75¢	
16 tons Lead, spot.....	3.77½¢	
16 tons Lead, April.....	3.80¢	
SATURDAY, February 9.		
10 tons Lead, spot.....	3.70¢	
MONDAY, February 11.		
30 tons Tin, May.....	21.40¢	
16 tons Lead, spot.....	3.70¢	
TUESDAY, February 12.		
20 tons Tin, March.....	21.10¢	
10 tons Tin, April.....	21.20¢	
10 tons Tin, May.....	21.20¢	
WEDNESDAY, February 13.		
10 tons Tin, spot.....	21.30¢	
10 tons Tin, April.....	21.45¢	

Important coke regions in Central Pennsylvania are being made accessible by the construction of new railroads. Deeds have been recorded at Brookville by the Fisher Improvement Company upon 2600 acres of land located along the Big Mahoning Creek. The sum paid for this is \$169,775.

Coal Market.

The Anthracite Coal market is still handicapped by a production disproportioned to the demand, and prices are maintained with difficulty. Individuals have made sales as low as \$4.25 for Stove and \$4 for Chestnut, alongside. A break by Ario Pardee & Co., of the Lehigh Coal Company, caused a sensation, but was explained as affecting only the production of the private collieries at Hazleton, as the large companies would not attempt to compete. It was also said that the reported 25-cent cut by Pardee was simply retaliation directed against Cox Brothers & Co., whose mines adjoin and who have fixed prices regardless of recognized schedules. Restriction is still the order of the day. For the week ending February 9 the total of shipments from the mines was 460,535 tons, a decrease of 53,000 tons compared with the previous week and over 100,000 tons decrease compared with the corresponding week in 1888. Since January the production aggregates 3,208,819 tons, a decrease of only 44,000 tons compared with the same time last year.

The Bituminous trade is dull. Report says that a Soft Coal trust has been formed to stop the competition between the Kanawha and Monongahela operators, and a movement for reorganization of the Clearfield Bituminous Company is spoken of; also another spur or extension of the Bush Creek Railroad, 12 miles long, to penetrate the Clearfield region.

The case of Cox Brothers & Co. against the Lehigh Valley Coal Company was finished on Tuesday before the Interstate Commissioners, so far as the testimony is concerned, and counsel will submit argument on March 1.

In his examination Eckley B. Cox testified as to the cost of Coal production. The general average in the Lehigh region he placed at \$1.45 ¢ ton. He said that his firm last year produced and sold 1,139,332 tons of Anthracite Coal, from which they made a net profit of less than \$7000. The income from royalties was very large, however.

Mr. Frank M. Kelley, official representative in this city of the Reading Coal interests, has fully entered upon the discharge of his duties at the Washington Building.

The total output of Coal in Tennessee in 1888 was 1,967,297 tons, against 1,715,290 tons in 1886. Total value of Coal mined, \$2,262,391.

Important purchases of Coal lands not far from Pottsville, and south of Broad Mountain, are said to have been made lately by Calvin Pardee, in the interest of the Lehigh Valley Railroad.

Financial.

Accounts relating to trade and finance are more cheerful. The most glaring exception is the collapse of the Western Coal and Iron Company immediately following the failure of the Pacific Guano Company, of Charleston and Boston. The volume of general business is very large, due in no small measure to speculative activity. The aggregate clearings of all principal cities show a gain of 29 % compared with last year. In New York the gain is 35.6 %; outside of New York 18.4 %. Northwestern points are irregular, St. Paul and Minneapolis falling behind, while Duluth, Denver and Kansas City gain largely. Industrial centers at least hold their own. It has been incorrectly assumed that interstate rates would be affected by the reduction of Iowa rates to the Commissioners' tariff. Iowa rates are higher than those of States East, and railroad managers now admit that none but local

rates will be affected. Iowa shippers will demand that all overcharges paid by them pending Judge Brewer's decision be refunded. The sum is claimed to be \$3,000,000. A railroad presidents' meeting relating to the general subject will soon be held in this city. In the case of the North River Sugar Refining Company, charged with illegal combination, Judge Barrett denied the application for a stay of proceedings pending an appeal from his previous order dissolving the company and directing a receivership.

Colonel Lamont, the President's adviser, is to locate in this city after the 4th of March as president of the Avenue C Surface Railway Company. The commutation of the sentence of Jas. D. Fish, former president of the Marine Bank, is followed by the suit of Yates & Potterfield, creditors of Grant & Ward, against Julien Davies, assignee of the firm, to compel him to give an accounting of all his transactions in connection with the affairs of the firm since he accepted the assigneeship, May 8, 1884.

The Stock Exchange markets were irregular, each advance being followed by reaction. On Thursday the Villard shares and New England were the features, with the whole market active and strong. On Friday, among other causes of depression, was the failure of the Pacific Guano Company. The acceptance of over \$3,000,000 bonds by the Secretary of the Treasury served as an offset. On Saturday business was dull. The bank statements had little influence. Transactions in bonds were large. Union Pacific closed at 64, but rose on Monday to 66½, owing to the prospect of Congressional action on the Funding bill. The general list was depressed by a break in Burlington, but closed buoyant, led by the Vanderbilts. The trunk lines were firm on the fact that a meeting of the Executive Committee had been called to ratify the new agreement, and that the presidents would act subsequently. On Tuesday the grangers were unfavorably affected by the news that only 15 out of 22 roads had signed the presidents' agreement. One feature was an erratic speculation in Pullman on the announcement that \$5,000,000 of new stock would be issued.

Government bonds were firm at the following quotations:

U. S. 4½, 1891, registered.....	106
U. S. 4½, 1891, coupon.....	106½
U. S. 4, 1907, registered.....	123½
U. S. 4, 1907, coupon.....	123½
U. S. currency 6s.....	120

Sterling is firm, with posted rates at 4.87¢ @ 4.89¢.

Contracts were signed on Tuesday for the construction of 250 miles of the Charleston, Cincinnati and Chicago Railway, running from Charleston, S. C. via Rutherfordton, N. C., to the Ohio River at Ashland, Ky. The company have already under operation 400 miles of road. The projectors of the scheme claim that this line will make a direct route of 800 miles from Charleston, S. C., to Chicago, or 100 miles shorter than any other line from Lake Michigan to the Atlantic Coast, and that it opens up the richest mineral, timber and coal country on the continent. A. B. Harris, of Boston; Frank Cox, of Philadelphia; Wharton Barker, of Philadelphia; R. A. Johnson of Boston; General Thos. L. Rosser, and other well-known men are interested.

The weekly exhibit of the Associated Banks shows an expansion in loans of \$8,103,900, a loss in cash of \$3,789,100 and an increase in deposits of \$3,816,400. The banks lost \$4,740,200 in surplus reserve and hold \$14,152,975 above legal requirements. By the purchase of \$3,000,000 of bonds on Friday at a slightly advanced price the Secretary of the Treasury liberated nearly all the surplus money accumulated thus far during the month. An

increase of about \$21,500,000 in bank loans within a month is assumed to be evidence of requirements in the street not being warranted by the mercantile demand. Time loans on good collateral were quoted at 8% for 60 and 3½% @ 4 for 90 days and 4½% @ 5 for four, five and six months. Rates are 4 @ 4½% for 90 to 90 days' indorsed bills receivable. Exports of specie during the week were \$477,000 and imports \$186,000.

In several important commodities prices show an upward turn, in pleasing contrast with the drooping tendency noticed for several weeks. Wheat advanced 2½¢ @ 2½¢ above the latest of Saturday for spot, and flour had a better tone. Exports of provisions were again very large, comprising 9,000,000 lb of bacon and 8,000,000 lb of lard from all the Atlantic ports. Prices of cash lard in New York broke several points. Coffee decidedly firm for spot goods. Cotton was stronger on the Bureau report indicating only 6,800,000 bales for the outside crop. In the West the fact is emphasized that an incalculable amount of corn has been saved this winter by mild weather, so that the reserve is larger than for many years. Exports of corn from Baltimore during the week exceeded 4,000,000 bushels. In dry goods jobbers notice a widening demand, but are much exercised by a threatened war in prices, originating in Chicago. Exports of leather are more active. A purchase of tea comprising 52,000 packages was the largest transaction of the kind known in this market.

A significant feature in trade is shown by the official returns of the foreign commerce of this port for the month of January. The imports for this month were larger by \$5,000,000 than for any corresponding month in the history of the port, amounting to \$45,432,699, as compared with \$38,000,000 for the same month last year. The exports were on a corresponding scale, the total, exclusive of specie, being \$184,834,000, showing a gain of \$6,000,000 in the shipments of merchandise compared with 1888. A season of uninterrupted navigation and favorable conditions for railroad transportation serve to explain the extraordinary gains.

Imports of merchandise at this port during the week and since the 1st of December have been exceptionally large for this season of the year. For the week the value is \$10,413,000, of which nearly \$3,600,000 represents dry goods. Since January 1 the total is \$60,470,000, as compared with \$55,825,000 for the corresponding period in 1888 and \$51,420,000 in 1887.

British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]
LONDON, WEDNESDAY, February 13, 1889.

The market for Block Tin has been unsettled and weak under the pressure of large lots for sale, due, it is alleged, to anticipation of heavy shipments from the Straits. The decline during the week was about £2. 10/, of which 10/ has been recovered the past few days under improved demand.

The Copper situation is without visible change. The syndicate agents still take up prompts at £77. 10/, but seemingly ignore three months' futures. "Outside" offers of the latter are said to be made at as low as £70, in the face of the quotation of £75 as the syndicate's nominal price. It is also stated that a line of 500 tons was offered at as low as £62, sellers' option all the year, without leading to business. Sales of Best Selected English are

said to have been made at £72. While prices are thus paradoxical, and legitimate business at a minimum, the negotiations between the syndicate representatives and the mining companies and other interests concerned in recent projects are shrouded in mystery that tends to additionally complicate the situation.

A larger business is reported in Tin Plate, mainly on the basis of 13/ for B. V. grade Cokes for early delivery. A line is said to have been closed out in Liverpool recently at 12/6. Makers continue to express confidence in a higher market. The stock at British shipping ports is estimated at 299,000 boxes. The exports to the United States last month were 21,000 tons. The Aberdare Company have purchased the Panteg Forge, and are erecting mills there to make Plates. Three mills have been started up at the Pontymister works, and two at the Victoria works. The Old Lodge Iron Works are being converted into a Plate works.

There is no improvement whatever in the American demand for Pig Iron, but the Continental trade is larger, and this, together with a good home demand, has developed a stronger market. The better tone in time has led to freer speculative purchases of Scotch "warrants," under which prices advanced to 42/. Exports to the United States last month were 10,000 tons. On most brands of Scotch Pig prices have advanced 6d @ 1/ during the week. Middlesbro' Pig has sold at 6d. advance, as has also Bessemer Pig, while holders of the latter ask an additional 6d at the close. Spiegel-eisen failed to move at the advanced prices asked last week, and some sellers put their figures back to 80/.

Negotiations in the direction of forming the Steel Rail syndicate are still pending, but up to the present time nothing definite has been accomplished. The price of Rails continues to harden, however, under the influence of an active demand, and makers are now asking a further 5/ rise. Billets are also stronger, with 2/6 advance generally quoted, but Blooms and Slabs have been sold from stock at concessions from the extreme figures asked last week.

Scotch Pig.—There has been a more active trade, particularly in the best markets, and the market is strong.

No. 1 Coltness, f.o.b. Glasgow	52/
No. 1 Summerlee, " "	51/
No. 1 Gartsherrie, " "	49/
No. 1 Langloan, " "	50/6
No. 1 Carnbroe, " "	44/
No. 1 Shotts, " at Leith	49/6
No. 1 Glengarnock, " Ardrossan	47/6
No. 1 Dalmellington, " "	43/6
No. 1 Eglinton, " "	42/
Steamer freights, Glasgow to New York, 4/; Liverpool to New York, 10/.	

Cleveland Pig.—A large business has been done during the week, and the market is strong at 6d advance. No. 1 Middlesboro', G.M.B., 37/6; No. 3 ditto, 34/6.

Bessemer Pig.—Transactions more extensive in volume, with a further 6d advance in price obtained. West Coast brands, mixed numbers, 45/6, f.o.b. shipping point.

Spiegel-eisen.—The demand has been fair, but sellers were unable to secure the advance asked last week. English 20% quoted 80/, f.o.b. N. W. England shipping point.

Steel Rails.—Prices are up a further 5/, and the market strong, with de-

mand brisk. Heavy sections quoted at £4. 10/, and light sections £4. 15/ @ £5, f.o.b. at N. W. England shipping point.

Steel Blooms.—Trade fair but at somewhat modified prices. We quote £3. 17/6 for 7 x 7, f.o.b. at N. W. England shipping point.

Steel Billets.—The demand continues free and prices are firm at a slight advance. Bessemer, 2½ x 2½ inch, £4. 5/, f.o.b. at N. W. England shipping point.

Steel Slabs.—Trade in this line rather slow and prices somewhat irregular. Bessemer, £3. 17/6, f.o.b. at N. W. England shipping point.

Old Rails.—Demand continues rather slow and prices are nominal. Tees quoted at £3. 5/ @ £3. 6/, and Double Heads, £3. 8/ @ £3. 10/, c.i.f., New York.

Scrap Iron.—There is a fair business and prices are steady. Heavy Wrought quoted at £2. 2/6 @ £2. 7/6, f.o.b.

Crop Ends.—The dealings are fair and at about former prices. Bessemer quoted £2. 10/ @ £2. 12/6, f.o.b.

Tin Plate.—Trade has been slow, and prices are barely steady. We quote, f.o.b. Liverpool:

IC Charcoal, Allaway grade	15/3 @ 13/6
IC Bessemer Steel, Coke finish	11/6 @ 11/6
IC Siemens	12/9 @ 12/9
IC Coke, B. V. grade	13/ @ 13/3
Charcoal Terne, Dean grade	12/ @ 12/6

Manufactured Iron.—There is still a good business in most lines and prices remain very steady. We quote, f.o.b. Liverpool:

Staff. Ord. Marked Bars	£ s. d. @ 8 2 6
" Common	" @ 5 15 0
Staff. Bl'k Sheet, singles	7 12 6 @ 5 15 0
Welsh Bars (f.o.b. Wales)	5 2 6 @ 5 5 0

Tin.—The market irregular and unsettled, with trading active. Straits quoted to-day at £94. 15/, spot, and £95. 5/ @ £95. 10/ for three months' futures.

Copper.—Very slow trading and prices difficult to quote. To-day's prices are: Chili Bars, £77. 10/ for spot, and £70 @ £75 for futures. Best Selected, wholly nominal.

Lead.—A moderate business at steady prices. Quoted at £12. 15/ for Soft Spanish.

Spelter.—The demand moderate and prices about steady. Quoted at £17. 15/ for ordinary Silesian.

Foreign Markets.

EQUIVALENTS

Franc, Peseta or Lira	Cent.
Florin (Netherlands)	10.3
Florin (Austria)	10.2
Wire (Portugal)	36.9
Wire (Brazil)	1.08
Mark (Germany)	23.5
Pound	2.206
Picul	134.

EAST INDIES.

SINGAPORE, December 30, 1888.—Tin.—Our last report was dated December 17, since when the volume of business has been less than usual. Tin has kept very steady at about \$37 per picul, but closes at \$37.25, and supplies are still restricted by heavy floods, otherwise we should have had a large production to deal with. *Gum Copal* is in moderate request and supply at steady prices at \$11 and downward. *Gum Damar*.—No good quality has been offered for sale. *Tonnage*.—Sailing vessel rates have been fairly maintained, while there has been some decline in steam freights to England. There is nothing offering for New York via Canal; the Norwegian bark *Norway* has been fixed via Cape for New York, while the *Antioch* and *Penobscott* are still loading for Boston. *Ex-*

change is firm at 3/2 $\frac{1}{2}$ dollar for 6 months' sight credits. On the 24th inst. the steamer *Bencoue* took for New York from here 3396 piculs of Tin.—*Gilfillan, Wood & Co.*

MANILA, February 4, 1889.—Hemp.—There are buyers at \$16.25 $\frac{1}{2}$ picul, against \$9 same time last year, equaling $\frac{1}{2}$ ton, cost and freight, 255. 3/8, as compared with 232. 2/8 in 1888; there have cleared for the United States since last cable none, against 4000 bales last year; since January 1, 38,000, against 17,000; loading for do., 45,000, against 3000; cleared for England since January 1, 20,000, against 21,000; loading for do., 17,000, against 2000; cleared for all other ports, 2000, against 2000; receipts at all ports since last cable, 18,000, against 16,000; since January 1, 60,000, against 49,000 in 1888 and 41,000 in 1887. *Freight.*—\$7.50, against \$5.50. *Exchange.*—6 months' sight 3/8 $\frac{1}{2}$, against 3/8.—*Ker & Co., per cable direct, through Mr. Charles Nordhaus, 89 Water street, New York.*

SINGAPORE, February 8, 1889.—Tin.—There have been shipped during January from the Straits Settlements to the United States 550 tons, against 400 last year; to England, 1200, against 3500.—*Gilfillan, Wood & Co.*

BELGIUM.

BRUSSELS, February 2, 1889.—Iron.—As had been foreseen, the associated rolling mills have resolved to raise the price of Merchant and Sheets 50 centimes $\frac{1}{2}$ 100 kg. The present price fixed by the syndicate is consequently 13 francs $\frac{1}{2}$ 100 kg. for No. 1, for export, and 12.50 for home consumption, while Sheets No. 2 are 15.50 for both export and home use. Pig Iron is extremely scarce. Athus sold 42,800 tons, to be delivered during the second quarter, at 4.70. This is all his capacity will allow him to turn out. As for Beams, a good current of trade still exists, orders flowing in a steady stream despite the active competition that comes to us from the north of France. The latter have even beaten our makers in the shape of some contracts they made for low quality Beams, f.o.b. at Antwerp at 11.25. They cannot, however, compete with our makers as advantageously in quality next to the lowest, so that frequently they share the execution of third quality Beam orders with our own makers. In this manner the latter bought, f.o.b. at Antwerp, from 12 francs to 12 francs 12 $\frac{1}{2}$. The Dyle-Bacalan Car Works received an order from Holland of 450 cars, but was unable to secure another order for five bridges for Tava, for which Dutch builders got the preference. It is now a positive fact that the cupolas for the Meuse forts will be built by foreign concerns, such as the Gursen, of Magdeburg; the Creusot, the Saint-Chamond, Châtillon and Commeny, but some of our Belgian works participate therein on joint account.—*Moniteur des Intérêts Matériels.*

SPAIN.

BILBAO, January 26, 1889.—Pig Iron.—The amount of Pig Iron turned out in our immediate vicinity aggregated last year 136,200 tons, distributed as follows:

	Tons.
Altos-Hornos.....	8,500
San Francisco (Mudela).....	14,800
La Sociedad Vizcaya.....	26,600
<i>Sold for Export.</i>	
Altos-Hornos.....	13,400
San Francisco.....	25,300
La Sociedad Vizcaya.....	47,200

The Sociedad Vizcaya is the youngest of the three.—*Bilbao Marítimo y Comercial.*

GERMANY.

HAMBURG, February 2, 1889.—Iron.—The Rhenish-Westphalian Iron market has maintained its firmness. Pig Iron has been even more active. This may be said with reference to Spiegel in particular, makers now declining to sell any further amounts deliverable during the second quarter at 59 marks. There has been an uninterrupted but slow upward movement in Forge Pig, which is now 1 $\frac{1}{4}$ marks higher than it was a week ago, the range now being 51.50 @ 53 marks $\frac{1}{2}$ ton, while at Siegen no more can be got at 50. Thomas has been active at 46, Bessemer at 55. Foundry Pig was also better, the range being from 54 to 61; Luxembourg may be quoted 54.50 @ 42 as a range as to quality. English Bessemer is worth 45/. Boiler Plates have advanced 5 marks, and other rolling mill products in proportion. The Wire branch revives comparatively slowly; machine shops and carworks continue doing well, the latter in particular, 12,000 freight and passenger cars having just been ordered for the domestic railways. We quote Wire Rods 106 @ 108, Steel Rails 120 @ 130, and ditto for mines 110 @ 115. Metals are steady and unaltered.—*Borzenhalla.*

The Stove Association.

From the address of George H. Barbour, president of the National Stove Association, we call the following:

Gentlemen.—Another year has passed and we again assemble together for a friendly interchange of opinions and to discuss measures for the general improvement of our business. While it would afford me a great deal of pleasure to be able to say to you that the business at large was upon a substantial and profitable basis, I regret to say that at no time since the organization of this association was there more need of association in the true sense of the term, nor was there ever a time when it seemed so imperative that we should reason together for the purpose of trying to eliminate the evils which have gradually crept into the business, and to endeavor in some way to lay out such plans for the future as will insure fair interest upon the capital invested.

STATISTICS OF THE STOVE TRADE.

From the best information I estimate that the value of the production of stoves for the year 1888, as near as possible, is \$83,000,000. This includes, of course, all grades of cooking stoves, ranges and heating stoves. Your secretary will give you this subject more in detail. It may be estimated that about 23 $\frac{1}{2}$ per cent. of the actual production is a fair percentage of stocks carried over the present year. It would be natural to expect that the average carried over this year would be a little in excess, owing to the very warm weather which has prevailed this season.

While it is somewhat uncertain to predict the future, I state as the best of my judgment that if we have a favorable season's business, meeting with no extraordinary disasters, and go along in even tenor of our way, much higher prices will be obtained for pig iron before the close of the year. I see but one way for any great improvement in this direction, and that is for the furnacemen to curtail their production for a period, by 35 per cent. to 50 per cent.

IS THERE OVERPRODUCTION IN THE STOVE TRADE?

Now, to a greater or less extent, these same conditions may exist with our stove manufacturers. It is generally conceded by those well informed that there does exist to-day, and has existed for several years past, an overproduction. To solve this problem is somewhat of a difficulty. I believe there is hardly any manufacturer who intends to produce largely in excess of what he thinks his trade will absorb. Nevertheless, there are few to-day but carry more or less of an excess of stock. We go along from year to year, thinking perhaps instead of increasing next year we will carry less, but we are disappointed.

THE HOLLOW-WARE BUSINESS.

Let me call your attention to another subject that I deem worthy of your consideration. The hollow-ware business, as probably all will admit, properly belongs to the stove manufacturer. Is he to-day getting any benefit from it? I think not. On the other hand, it has virtually passed out of his hands, and the trade is controlled principally by the wholesale hardware merchants. It would seem that there is but one of two things to do—either the manufacturers of stoves, as a body, should control it, or else give it up. Under present conditions there is no money in it to any manufacturer, but I believe that they can gain this part of their business back, although it may mean a struggle and a loss of money for a short time. I commend this to your attention.

FREIGHT ALLOWANCES.

There is another abuse which has become a very serious matter to all members of

this organization and to all stove manufacturers at large—the allowance of freight and other concessions. They have crept in upon us gradually from time to time, until they are like the "roaring lion seeking whom he may devour." They are a very heavy tax upon any manufacturer, and are increasing instead of decreasing. I am undecided what to suggest in this particular. Their abolition can only be accomplished in one way, in my opinion, and that is by an ironclad agreement among manufacturers, after intelligent discussion by your body.

THE PIRATES.

There is one subject which I touch upon with some reluctance; it is a serious one to every stove manufacturer. It is the subject of pirating our goods. I will not go into the details, to give you the volume of business that has been built up by these concerns, which we term, and correctly, too, pirates. I believe I may safely say there is hardly a leading house to-day whose goods have not, to a greater or less extent, been taken, or parts of them taken, and filed up and offered to the trade in the way of repairs at from 2 to 3 cents per pound less than the original manufacturer's price.

Let me call your attention, going back a few years, to the time when, in one of your meetings, I advocated that every member of your association should meet these prices. I think our members believe that it was a great mistake not to have done it. I do not hesitate to say now, had the leading manufacturers, or the majority of our members, adhered to the basis of price, asking only the pirates' prices, we would have seen to-day no such state of things as actually exists. Now, this is a matter which disturbs nearly all of our manufacturers. The pirate has gradually built up his business year by year, adding largely to his stock of patterns, which has been taken from legitimate stoves, filed up and used.

DOING BUSINESS ON INSUFFICIENT CAPITAL.

Is there not a state of things existing that is full of danger? Are not a good many of our present stove manufacturers endeavoring to largely increase their business upon too small capital? I have reason to believe this condition exists and it would seem to me that any manufacturer who is trying to do this is placed in a position where he cannot very well maintain his prices. The stove business is very peculiar, as every manufacturer can vouch for. He has to prepare early in the year to manufacture his products. Our spring trade for several years past has been gradually decreased by the use of vapor and coal-oil stoves, so much so that he has to carry his products much longer than in previous years, so that the majority of his sales are made in the fall months. It used to be not difficult to date invoices for fall September 1, four months; but now it is often September 15, and not infrequently October 1, so that from the time he commences to manufacture early, or from the first of the year, he has to carry his stock a much longer time than ever before, and I believe it can be truthfully said that it requires 88 to 50 per cent. more capital than it did five years ago, a point too often overlooked. The remedy seems to be in your own hands. Every manufacturer should know his own circumstances best; I refer to the subject that it may have your best consideration, and while this is something outside of this body to act upon, I may induce some one to consider the matter and find out whether these troubles are not brought about by such a state of things as I have mentioned.

Edge Hill Furnace, one of the Schuylkill Valley anthracite furnaces, is about to go out of blast.

Hardware.

There is a fair amount of business doing, but orders are generally limited to moderate lots to meet the early requirements of the purchasers. Stocks throughout the country are generally light, but while there are good prospects for the season's trade buyers are disposed to be conservative in placing their orders. Prices in most lines are unchanged, and are in many instances so low that a good demand would soon result in strengthening the market and perhaps cause some advances.

Barb Wire.

The market in this city presents no new features. Local prices are pretty well maintained, but the transactions are quite limited. The New York quotations remain: Carload lots, 3.6 cents; 3-ton lots, 3.7 cents, and smaller lots, 3.9 cents.

Wire Nails.

Prices of Wire Nails are pretty steady at the low figures ruling, but in some cases current quotations have been slightly shaded. The volume of business is good. We still quote carload lots at factory, \$2.30; smaller lots at store \$2.50 to \$2.60.

Miscellaneous Prices.

The Globe Nail Company, Boston, Mass., are making a new hot forged Horse Nail, which they brand Boston. It is sold from the following list, which is subject to a discount of 20 and 2½ per cent:

No.....	5	6	7	8	9	10	11
	\$0.26	.23	.21	.20	.19	.18	.17

They issue circulars describing this Nail, in which they call attention to its merit, another circular being devoted to their Globe Nail.

Nason Mfg. Company, 71 Beekman street, New York, have issued under date February 5 a discount sheet applying to their illustrated catalogue No. 86, with subsequent revisions. It opens with the following discounts, which are followed by prices on a large variety of goods:

	Discount.
Lap-Welded American Charcoal Iron Boiler Tubes.....	50 %
Wrought-Iron Pipe, On list prices as revised 28d March, 1887: Plain 1½ inch and under, whole lengths.....	57½ %
Plain 1½ inch and over, whole lengths.....	67½ %
Galvanized 1½ inch and under, whole lengths.....	47½ %
Galvanized 1½ inch and over, whole lengths.....	52½ %
When cut to order, advance 5 % on discount, and labor cutting charged extra.	
Extra and Double Extra Heavy W. I. Pipe:	
Plain 1½ inch and under, whole lengths.....	55 %
Plain 1½ inch and over, whole lengths.....	65 %
When cut to order, advance 10 % on discount, and cutting extra.	
Iron Hydraulic Pipe.....	Net.
Heavy Drive Well Pump.....	Net.
Light Galvanized Leader Pipe.....	50 %
Galvanized Adjustable Elbows.....	10 %
Spiral Riveted Pressure Pipe.....	50 %
Fittings for Spiral Riveted Pipe.....	20 %
Cast Iron Drain Water and Smoke Pipe.....	60 %
Cast Iron Water and Gas Pipe.....	Market rates.
Lead Pipe, 6 cents per pound.....	Net.
Cast Iron Fittings.....	70 & 10 %
Bushings and Plugs.....	75 & 10 %
Cast Iron Flanges.....	70 & 10 %
Branch Tees, Hook and Expansion Plates.....	67½ %
Malleable Iron Bushings.....	75 & 10 %
Malleable Iron Unions.....	67½ %
American Unions.....	45 %
Wrought Iron Fittings.....	
Quarter Bends and Long Screws.....	67½ %
W. I. Couplings and Nipples, list prices revised on January 20, 1887.....	67½ %
Cock Wrenches.....	60 %
Gas-Pipe Hooks, Wrought Iron.....	Net.
Ceiling and Floor Plates.....	67½ %
Blake's Adjustable Pipe Hangers.....	30 %
Malleable Iron Fittings.....	35 %

The manufacturers of Common Carriage Bolts have united in announcing a reduction in the price of the goods, the discount

being made 75 and 10 and 2 per cent., with the deliveries and the discounts on quantities unchanged.

For some time Copper Rivets and Burrs have been selling at lower prices than were justified by the cost of the raw material, but the manufacturers have taken a step toward the correction of this unsatisfactory condition of things by making a decided advance in the prices of the goods, the discount on which to the general trade is made 50 per cent.

The manufacturers of Steel Traps on the 5th inst. advanced the list of No. 1 Traps, without chain, to \$3.75 per dozen, and with chain to \$5 per dozen. This, it will be observed, is an advance of 25 cents on the list. No change has been made in the discount.

The Jobbing Trade.

Referring to the disposition of the jobbers to handle, as a rule, goods that are well known, and also to disregard to a certain extent quality under inducements of price, a New England manufacturer writes:

As far as our experience goes with jobbers versus retailers, we have found that jobbers invariably have sought the lowest prices without regard to quality, and this has prevented their customers from being offered goods they would have preferred had they been able to buy in such quantities as they needed. I have more than once been told by the buyers of large jobbing houses, "We don't care whether the goods are good for anything or not, only make the price low enough and we will give you all our trade. Our orders are mostly mail orders, and if we send them something that looks like a Plane it is all we care, if the price is low enough." Such a course compels manufacturers to make inferior goods, or else do all they can to deal with the retailers direct, who have some interest to keep the best articles.

The following letter, from a well-known Pennsylvania manufacturing concern, relates to their experience in trade and to the advantages of having their transactions largely with the jobbers:

The proportions of orders from retail dealers is, and has been for some time, on the increase, but we have not the remotest idea that we will ever do without the jobber, or ever want to do so. The higher prices paid by the smaller trade are an inducement in those days of small profits, but, on the other hand, where goods are going to the jobber they are mostly packed as fast as made and do not go to bins or shelves. Again, we are far more troubled in the smaller dealers' orders by changes demanded from our regular patterns and by difference in terms by which sizes, styles, &c., are designated. The jobber often acts as a modifier of these demands, as he does not multiply his sizes, &c., any more than necessary. However, this disposition on the part of the jobber keeps him from introducing new goods for us. We want all the trade we can get from jobbers and retailers, but we believe that the manufacturer will best serve his own interests by making a fair distinction between the prices to them. We ought to have said that the increase in our orders from the smaller dealers comes generally from a radius of 200 miles. Outside of this our trade throughout the United States is almost exclusively held by the jobbers.

Items.

The Michigan commercial travelers formed an organization, at Lansing, on the 9th inst., to be known as the Knights of the Grip, and formally withdrew from the National Travelers' Protective Association. Their object is to secure legislation to more fully protect their rights; to secure as favorable rates from the railroads on baggage as other classes of travelers; to secure better hotel accommodations, and to adjust differences between hotel men and members; to elevate the social and moral character of the profession, and to assist in procuring employment for its members. The officers are: President, Albert F. Peake, of Jackson; secretary, L. M. Mills, of Grand Rapids; treasurer, George C. Cooper, of Lansing; sergeant-at-arms, E. L. Bennett, of Lansing; chaplain, the Rev. Charles Fluhrer, of Grand

Rapids; board of directors, L. J. Foster, of Detroit; A. A. Howard, of Coldwater; George F. Owen, of Grand Rapids; W. J. Richards, of Union City; Charles A. Ballard, of Lansing, with a vice-president from each Congressional district. Standing committees were appointed on railroad transportation, legislation, bus and baggage, hotels, relief, employment and the press.

Henry Disston & Sons have sold their Chicago building, having received a handsome offer from other parties, and have purchased a lot 102 feet by 22 feet on the corner of Washington and Jefferson streets, in that city, on which they will erect, under the supervision of H. D. Nicholls, their business manager, a substantial and elegant building, expressly adapted to their purposes.

Freeman Wire Company, St. Louis, Mo., issue a four-page leaflet relating to their Wagon department and showing some of the patterns of Express and other Toy Wagons which they are manufacturing.

Ideal Mfg. Company, Detroit, Mich., issue a circular relating to the Ideal Revolving Lawn and Garden Sprinkler, and the Ideal Favorite and Jewel and the Cyclone Hose Reels and Trucks. These different goods are illustrated and the list prices given.

The Wire Goods Company, of Worcester, Mass., have bought out the plant of the Burditt & North Automatic Blind Fixture Company, together with the various patents and rights pertaining thereto. They will move the business to Worcester and engage in it upon a considerably enlarged scale, and will add it to their already quite extensive line of Hardware. They will be ready to supply the trade for the coming season from their factories at Worcester, Mass.

Fowler & Sons, Buffalo, N. Y., in the recent fire lost their entire stock of Carriage Goods, Woodwork and Heavy Hardware. Their Iron and Steel business, however, being separated from their store, was not affected by the fire, and they are now doing business from that office as usual, and solicit the patronage of their customers and friends for Iron and Steel, of which they have a most complete stock. Their insurance is \$125,000, their loss being put at \$150,000. Their Bolt works at Anderson, Ind., are not affected and continue as usual, so that they are in a position to furnish Common Carriage and Machine Bolts, Lag Screws, Bolt Ends, &c., for which they invite inquiries.

Instead of putting their Steel Tapes on the market nickel plated, as originally intended, the Lufkin Rule Company, Cleveland, Ohio, are making them in solid German silver cases, which are referred to as better wearing than the nickel, an improvement which has been made without advance in price, though involving increased cost.

The trade will observe in the advertisement of Jenkins & Timby, Oswego, N. Y., the illustration which is given of Timby's Burglar-Proof Sash Lock and Ventilator. The points made in regard to it are: The security of the fastening, the ventilation secured by it and its automatic action. We shall have occasion to refer to it again.

The Baker Chain and Wagon Iron Mfg. Company, Allegheny, Pa., report their Wagon Hardware and special Forging departments as very busy, their orders for Baker Single Trace Clips, &c., being heavier than ever before.

The American Mfg. Company, Philadelphia, Pa., for whom the Lloyd & Supplee Hardware Company, Philadelphia, Pa., are agents, have purchased from the

estate of the Heaton & Denckla Hardware Company their interest in the France's Shutter Holder, together with the patents on the same. They will at once arrange for the manufacture of it.

Childs & Jones, Utica, N. Y., issue a price list devoted to Creamery and Dairy Apparatus and Supplies, in which a large variety of these goods is represented.

Studebaker Bros. Mfg. Company, South Bend, Ind., issue on separate sheets the revised price list of their Wrought-Steel Skein and the standard price-list of the S. B. Trade Cast-Steel Thimble Skein, of both of which goods illustrations are given with reference to their special features.

The Ridgway Refrigerator Mfg. Company, 813 and 815 Arch street, Philadelphia, Pa., issue as a supplement to their 1889 catalogue a sheet relating to Refrigerators illustrated in it. They are referred to as a correct combination of a Sideboard and a Refrigerator. The ice-tank slides over the box-lock and drawer, and rests on an iron support. With this construction, if desired, the tank can be taken entirely out and carried to any convenient place to receive the ice, thus doing away with the carrying of dripping ice through the house, or having the carpet soiled by the iceman. The top of the Sideboard is one solid piece without lids, and can be permanently used, as nothing need be removed from the top in order to insert the ice. The drinking water is obtained by means of a disguised spigot. In conjunction with the above features the box is so constructed that a thorough circulation of air passes entirely around the ice-tank. Several attractive patterns are represented, with description and list prices.

The open winter has had a somewhat injurious effect upon the demand for Chain, especially the fancy Chains, but an improvement is observable in the demand for Ship Cables.

Nelson Stelle, formerly Chicago manager for the Union Mfg. Company, of New Britain, Conn., has succeeded F. Gustorf in the firm of H. C. Maley & Co. The style of the firm has been changed to Stelle-Maley Company, incorporated on the 1st inst. Their business as manufacturers' agents will be carried on at the same place, 37 Franklin street. Mr. Stelle has been identified with the Hardware business for nearly 20 years, and is well known to the trade in the West and Northwest. The firm will represent the following firms in the territory tributary to Chicago, including the trade along the Mississippi and Missouri rivers and the Northwest:

E. R. Sexton, Buffalo, Braces.
Lansing Wheelbarrow Company.
J. H. Hoague, Chicopee, Mass., Chamfer Gauges, Tracing-Wheels and Spring Drills.
Wm. J. H. Gluck, Baltimore, Stamped and Japanned Ware.
S. P. Jennings, New Castle, Ind., Handles.
J. L. Wosting, Cast Shears and Snips.
Rock Island Knife and Shear Company, Cutlery.
Chester Mfg. Company, Chester, Conn., Auger Bits.
Empire Saw Company, Port Jervis, N. Y.
M. S. Brooks & Sons, Chester, Conn., Bright Wire Goods.
Keokuk Novelty Company, Sure Shut Spring Hinges.

In addition to the above goods the firm will handle their own manufactures in the line of Escutcheons, Carpet Stretchers, Handles and Family Soldering Irons.

The Maine Mfg. Company, Fairfield, Me., issue an attractive and well-printed catalogue showing their line of Refrigerators, and also Cotton's Patent Lawn Settees, Folding Camp Chairs, Folding Tables, Lapboards and Rockers. As a leading line special attention is called to the Refrigerators, and the following points are

made in regard to them: That no wood is exposed in the interior; that they are zinc-lined throughout; that the cold dry air circulation secures positive dryness; that they have large doors, giving easy access to the interior; and that the floors are flush with the door sills, making them easy to clean. The ice racks are made of galvanized iron and the ice chambers are of extra size. Illustrations are given of the different patterns, with list prices.

George Wheeler, representing John Chatillon & Sons, manufacturers of Scales and Butchers' Tools, 85 to 89 Cliff street, New York, spent some time recently in Chicago and vicinity, and met with gratifying success in taking orders for the specialties of the firm.

Edwin R. Procter, Gibson House, Cincinnati, has devised an ingenious return envelope, which appears to be well suited for use by business men who find it necessary to distribute circulars. It consists of an envelope with the flap lengthened to almost twice the size of the envelope. The back of the flap thus provides room for the printing of a circular. On the front of flap can be printed the address of the sender. For mailing, the flap is folded in two creases and thrust down into the envelope. It then looks like an envelope with a circular enclosed and the flap turned in according to the usual method. The end of the flap is visible in the V-shaped opening of the envelope, with the words printed, "Pull me out." The receiver of the envelope pulls out the flap, reads the circular, writes a reply on it if he desires, and turns the flap over so as to bring the printed address of the sender outside, wets a gummed end and fastens it down, thus making a sealed letter, and returns it to the mails. The inventor publishes a very interesting circular describing a great variety of uses to which this combined envelope, letter sheet and return envelope can be put.

The Standard Fibre-Ware Company, of Mankato, Minn., have established a branch office at 105 Lake street, Chicago, under the management of O. L. Baskin, who will carry a full stock from which direct shipments can be made. The company manufacture plain and decorated Pails, Wash-Basins, &c., from flax fiber. They have issued a variety of illustrated circulars, and are distributing a calendar of artistic design.

The Haardt Enameled-Ware Company, importers and manufacturers of Vienna enameled kitchen utensils and specialties, have established an office at 105 Lake street, Chicago, under the management of Franz Koelling. They issue an illustrated catalogue and price list of their goods comprising 28 pages. This ware is furnished in blue and white, brown and white or all white at the same price. Banded articles are furnished with blue or gold bands at 20 per cent. advance on the list price. Green and red bands are furnished on application. Marbled or veined articles are furnished in light blue, light green, light brown, dark blue and pike gray at 20 per cent. advance on the list price. Fancy hand-painted articles are supplied at 50 per cent. advance on the list. A full stock will be carried.

One of the papers of Springfield, Ohio, has an article referring to the manufactures of the city and the prominent place it occupies in the production of Farm Implements. It is suggested that a syndicate of Springfield manufacturers be formed, who should open a general shipping office in New York and receiving offices in the prominent ports of South America and Europe, with a view to cultivating on a large scale export trade in the large line of Farm Implements manufactured in that city. Reference is also made to the ac-

tivities in the different manufacturing establishments, showing their growth and enterprise.

We are advised that the firms of J. H. King, King & Barlow, Geo. H. Barlow and Brigham & Follett, Cory, Pa., are no longer in existence, but that Barlow Brigham & Follett, Limited, succeed them.

The American Screen Company, Brookline, Mass., issue a circular in which they call attention to some of the advantages of the American Flexible Metallic Frame Sliding Wire Window Screen, alluding also to late improvements of steel or brass slides and metallic handles. The company also make Screen Doors of 1½ stock in either pine or hard woods.

Geo. K. Oyler, St. Louis, Mo., issues a catalogue devoted to the Plow Coulters, Blades and Hubs of which he is manufacturer, giving illustrations of the different patterns, and calling attention to the special features of the goods. It is accompanied by a sheet of prices to the trade.

The catalogue of Mast, Foos & Co., Springfield, Ohio, is devoted to their Buckeye Force-Pumps, Iron Turbine Wind Engines, Iron Fence, Buckeye Senior and Junior Lawn Mowers, &c. In addition to the illustration of the goods, it contains a number of pictures representing their use, with such subjects as "A Country Seat on the Delaware," "Scene in Portugal," "A Characteristic Scene on the Texas Rancho," &c.

Simmons Hardware Company, St. Louis, Mo., issue the "Keen Klipper Herald," which is devoted to lawns, with full descriptions of their Keen Klipper Lawn Mower, the construction and merits of which are alluded to at length. Directions are also given as to how to make a lawn, with other miscellaneous reading matter.

Peters Cartridge Company, Cincinnati, Ohio, have issued their catalogue for 1889, in which, besides illustrating their Cartridges, giving list prices, &c., they present a number of certificates from sportsmen in regard to the excellence of the goods. As relating to a standard line which has made a place for itself in the trade the catalogue is of interest.

May & Co., St. Louis, Mo., call attention in a circular to May's Boiler Compound, which is referred to as removing from boilers all scale of whatever formation, whether deposited from salt or fresh water, and also preventing the deposit of scale by holding the mineral properties of water in solution and preventing foaming and fermentation. It is alluded to as entirely free from acid, having no injurious effect upon the boiler, being easily applied, and securing a saving of power, water, fuel, expense and labor.

Simmons Hardware Company, St. Louis, Mo., illustrate in a circular the Rysdick and the Princeton Armless Road Carts. In calling attention to the former they allude to it as new in principle, symmetrical in appearance, strong and durable in construction, and call special attention to the fact that the weight is thrown altogether on the axle by the use of the Thomas Coil Spring.

J. W. Garratt & Co., St. Louis, Mo., manufacturers of Church, Fire Alarm, Tower, Clock, School, Factory, Depot, Ranch, Ship, Steamboat, Locomotive and other Bells and Gongs, issue a catalogue in which their line of goods is illustrated. The front is attractively printed in bronze, with a representation of the famous Liberty Bell in Philadelphia.

Western Block Company, Lockport, N. Y., is composed of five members who for a number of years have been in the employ

of the Penfield Block Company and Boston and Lockport Block Company. They commenced manufacturing about December 1 and are now in full operation. They run by water power, the excellence of which is referred to, and have a steam plant ready to use in case of accident to water-wheel or connections. They are confining their attention to the manufacture of all kinds of Wood and Wrought-Iron Tackle Blocks and Iron and Lignum-Vitæ Sheaves.

Keeping Account of Stock.

A correspondent of *The Metal Worker* writes to that paper as follows :

I wish to get the idea of the Editor or of the readers of *The Metal Worker* concerning a simple plan of stock-keeping. It should be adapted to the requirements of a retail store, where the goods are numerous and varied. In such cases some items are being exhausted daily, piece by piece, until finally it is discovered that you are out of a certain article unawares. It always happens that there is a demand for just that thing at that time, apparently because you have not got it in stock. Now, a simple plan of keeping account of stock going in and out, it seems to me, would be a barometer to the retailer, valuable both as indicating his wants in the line of stock and the amount of stock on hand. It certainly would be of great value if kept correctly. It is often the case that the retailer in ordering goods goes by guesswork, and thereby orders duplicates of what he has already in stock, and omits much that he is actually in need of, or it occurs that he does not order in proportion to the demand that exists for certain goods. Then there follows the expense of telegraphing, express charges, &c., all of which add to the cost of doing business. A plan of stock-keeping, it seems to me, could be inaugurated which would avoid all this, and, in addition, would pay for the labor spent upon it. It seems to me that stock-keeping should be one of the cardinal features of a well-arranged and well-managed retail store.

In reply the Editor of *The Metal Worker* says :

Our correspondent presents a narrative of experience which is parallel to that of many of our readers. The annoyance of being out of articles, or of having a duplicate lot come in, resulting in a surplus of stock, is experienced more or less by every retailer. Various plans are resorted to for avoiding this, but we doubt if any one has discovered just what will answer the purpose in all cases. We presume that all our readers are open to suggestions on this point, and, therefore, think a discussion of methods can be secured which will be very generally acceptable. In some stores that we know of what is called a "tickler," or reminder, is hung up conspicuously in the office, upon which each clerk or salesman is required from day to day to make memorandum of the goods which he thinks are needed, including the goods which are to be in special demand, and an account of those the stock of which is becoming low. This tickler, or reminder, is variously managed, and is sometimes kept in the form of a book and in other cases it is a slate or a sheet of paper fastened against the wall.

Our correspondent's suggestion, based, as is evidenced by his remarks, upon considerable thought upon the subject, is radical in the extreme. His idea is to have some plan of accounting which shall show what goods are in stock, what is going out and what is coming in. This is a comparatively easy thing to do where the number of articles is small and where the articles are not large. But when it comes to the vast line of goods carried by retail hardware stores the difficulty of managing

such an account satisfactorily becomes apparent. And yet large concerns, handling enormous stocks, virtually do the thing which our correspondent outlines. Take any of the large retail dry goods establishments for example. The business is conducted every day in the year except Sundays and holidays, and it would be impossible to stop to inventory in all departments the goods on hand to make up the profit account. Good accounting steps in and does all this for the retailer. By the system of accounting employed the buyer knows just what is wanted, and in the same way the goods on hand are always shown by the account, rather than as the result of invoicing. In business we are very apt to take good care of cash. We keep an account with cash, debiting it with what we receive and crediting it with what we pay out. From time to time the balance on hand is counted, not, as many might at first suppose, to show what we have on hand, but rather to prove the accuracy of the account which shows what we have on hand. When it comes to merchandise, however, we abandon all accounting in the sense of the cash account, and we buy and sell and go through a long term of months and then take account of stock, see what we have on hand, and thereby determine what we have made or lost. Now, it would seem that good accounting should take care of property whatever may be its shape just as it takes care of cash. We leave these ideas for the consideration of our readers and hope that some discussion will follow.

Arrangement of Stores.

The accompanying illustration, Fig. 807, represents a Sled rack, for a description of which we are indebted to Elsworth & Dudley, Poughkeepsie, N. Y. It occu-

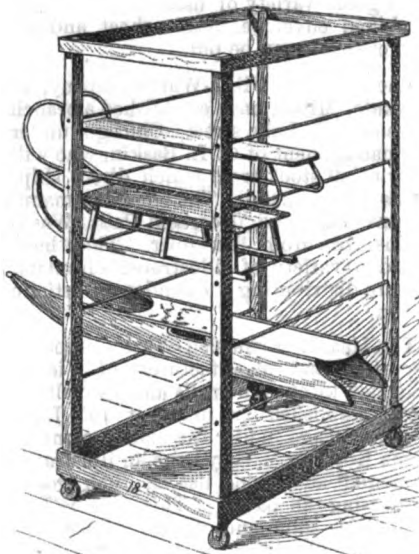


Fig. 807.—Sled Rack.

pies a space on the floor 18 x 30 inches, and is referred to as economical of room and accommodating the goods in such a manner as to secure an attractive display, while they are at the same time convenient of access. The bars on which the Sleds rest are made of $\frac{1}{4}$ -inch round iron.

Exports.

PER BARK ILIA, JANUARY 20, 1889, FOR CAPE TOWN, SOUTH AFRICA.

By Des Brisay & Allen.—61 Plows.
By Coombs, Crosby & Eddy.—90 dozen Axle Grease, 1 dozen Meat Cutters, 12 dozen Hatchets, 2 dozen Tools, 2500 Spokes.
By H. W. Peabody & Co.—2 cases Hardware.
By R. W. Forbes & Son.—11 cases Hardware, 4 gross Axle Grease, 1 package Stamped Ware, 6 dozen Mouse Traps, 1 case Lawn Sprinklers, 15 dozen Brooms, 13 dozen Axes,

$\frac{1}{4}$ gross Shade Rollers, 15 dozen Handles, 47 packages Agricultural Implements, 8 packages Agricultural Implements.

By W. B. Fox & Bro.—1 case Hardware, 2 cases Brooms, 1400 pounds Axle Grease, 1 case Handles, 2000 Handles.

By W. H. Crossman & Bro.—4 gross Shade Rollers, 50 dozen Brooms.

By John Norton & Sons.—12 $\frac{1}{2}$ gross Axle Grease, 15 Ranges, 1 case Fixtures.

By Arkell & Douglas.—1 case Pulleys, 1 case Carriage-Ware, 2 gross Axle Grease, 2 cases Braces and Bits, $\frac{1}{2}$ dozen Lawn Sprinklers, 10 Stoves, 6 dozen Door Springs, $\frac{1}{2}$ dozen Step-Ladders, 500 Broom Handles, $\frac{1}{2}$ dozen Scales, 1 dozen Ladders, 1 case Saws, 14 dozen Handles, 2 gross Shade Rollers, 5 dozen Traps, 6 cases Hardware, 1970 pounds Rope, 1 dozen Feed Cutters, 1 dozen Meat Cutters, $\frac{1}{2}$ dozen Churns, 6 cases Hardware, $\frac{1}{4}$ dozen Churns.

By Strong & Trowbridge.—1 case Handles, 16 cases Axes, 24 cases Axle Grease, 3 cases Brooms, 4 crates Churns, 2 cases Wire Goods, 2400 pieces Stoves.

PER SHIP ROBERT S. BESNARD, JANUARY 31, 1889, FOR SYDNEY, N. S. W.

By W. E. Peck.—31 Clocks, 4 reams Sandpaper, 9 packages Lamp Goods, 31 packages Hardware, 5 packages Plated-Ware, 3 dozen Planter's Hoes, 4 dozen Hay Forks, 7000 Cartridges, 5 Rifle and Tools, 1 case Lamps, $\frac{1}{4}$ gross Mouse Traps, 2 cases Plated-Ware, 9 packages Lampware, 1 gross Can Openers, 20 Rifles, 2000 Cartridges, 1 case Primers and Tools, 31 Clocks, 1 dozen Meat Choppers, 22 packages Hardware, 2 cases Plated-Ware.

By Strong & Trowbridge.—33 cases Handles, 2 cases Firearms, 1 case Tools and Firearms, 2 cases Cartridges, 4 cases Hammers, 1 case Hardware, 2 cases Rifles, 6 pieces Lampware, 2 packages Pumps, 1 case Tools, 13 packages Barrow Parts, 1 case Brooms, 2 packages Whips, 3 packages Hardware, 1 case Carpet Sweepers, 1 case Door Checks, 1 case Padlocks, 1 case Lampware.

By R. W. Forbes & Son.—174 Packages Sewing Machines, 5 packages Sewing Machines and Parts, 1 box Generators, 1 package Hardware, 1 package Hardware, 2 boxes Stubble Cutters.

By H. W. Peabody & Co.—23 cases Steel.

By A. S. Lascelles & Co.—1 dozen Wringers.

By F. Miller & Sons.—2 gross Blacking, 1 $\frac{1}{4}$ gross Blacking.

By Collins Company.—57 dozen Edge Tools.

By Meriden Britannia Company.—2 boxes Plated-Ware, 14 Packages Plated-Ware, 2 boxes Plated-Ware.

By W. K. Freeman.—2 crates Wheels, 12 bundles Whiffletrees.

By Woodhouse & Stortz.—1717 pounds Hardware, 18 dozen Axes.

By W. James.—23 cases Steel Carriage Springs and Parts.

By J. L. Mott Iron Works.—30 Stoves.

By Welsh & Lea.—6 cases Iron Bolts.

By Ansonia Clock Company.—5 boxes Clocks.

By Waterbury Clock Company.—21 cases Clocks, 5 cases Clocks, 3 cases Clocks.

By Russell & Erwin Mfg. Company.—21 cases Hardware.

By Edward Miller & Co.—37 packages Lamp Goods, 44 packages Lamp Goods, 81 packages Lamp Goods.

By V. Basanta.—114,000 Ammunition, 600 dozen Handles, 2 gross Whip Handles, 83 dozen Lamp Goods, 1 gross Barometers, 338 Clocks, 100 gross Paper Caps, 9 Perambulators, 10 dozen Washboards, 48 dozen Hammers, 18 dozen Wrenches, 9 dozen Oil Cans, 12 $\frac{1}{4}$ gross Axle Grease, 10 gross Blacking, 21 dozen Wrenches, 40 boxes Tacks, 3 dozen Money Drawers, 10 dozen Axes, 25 dozen Washboards, 111 pounds Washita Stones, 1 case Planes, 8 dozen Carriage Clamps, 5 $\frac{1}{2}$ dozen Ship Augers, 20 $\frac{1}{4}$ dozen Saws, $\frac{1}{2}$ gross Egg Beaters, 12 sets Sad Irons, 4 dozen Axes, 15 $\frac{1}{2}$ dozen Potato Mashers, 2 gross Wood Spoons, 6 dozen Rolling Pins, 25 boxes Clothes Pins, 48 dozen Springs, 102 $\frac{1}{4}$ dozen Locks.

By Arkell & Douglas.—4 dozen Picks, 10 dozen Axes, 5000 Handles, 30 dozen Washboards, 2 crates Carriage-Ware, 4 cases Bolts, $\frac{1}{4}$ dozen Corn Mills and Parts, 2 $\frac{1}{2}$ dozen Ladders, 4 boxes Lampware, 65 dozen Handled Axes, 25 dozen Axes, 25 packages Lamp Goods, 1 case Hardware, 2 $\frac{1}{2}$ dozen Guns, 8 dozen Tools, 150,000 Primers, 140 pounds Staples, 22 dozen Picks, 2 dozen Lamps, 5 Shellers, 14 cases Handles, 3 cases Bird Cages, 2 cases Skates, 12 dozen Traps, 5 cases Hardware, 2 gross Blacking, 2 dozen Picks, 6 dozen Axes, 3 crates Wheels, 1 crate Wheels, 2 boxes Castings, 5 cases Axes.

By Peters & Calhoun Company.—2 cases Saddlery.

By R. W. Cameron & Co.—60 dozen Axes, 20 dozen Tools, 81 dozen Axes, 2 cases Saws, 3 cases Ruling Machines, 4 packages Machinery, 1 case Skate Parts, 3 cases Skate Parts, 4 cases Roller Skates, 40 dozen Hatchets, 90

dozen Handles, 486 dozen Chimneys, 35 gross Wicks, 15,502 pieces Slate, 1600 pounds Sawmill Machinery.

By *E. W. Harrison*.—18,000 pounds Iron Castings, 1100 feet Leather Belting, 60 packages Iron Machinery, 4000 pounds Nails, 1 box Miners' Lamps.

By *H. S. Chipman*.—2 cases Hardware.

By *Healy & East*.—9 boxes Sawmills, 1 box Emery-Wheels.

By *Singer Mfg. Company*.—1105 Sewing Machines.

By *Bradley & Hubbard Mfg. Company*.—44 packages Lamp Goods, 20 packages Lamp Goods.

By *R. W. Cameron & Co.*—200 sets Car Springs.

By *F. B. Wheeler & Co.*—5130 pounds School Slates, 50½ gross Axle Grease, 1 case Castings, 1 case Clocks.

By *Coombs, Crosby & Eddy*.—8 dozen Handles, 3 dozen Hammers, 2 dozen Hatchets, 35 dozen Blocks, 2 dozen Row Locks, 2 dozen Shovel Handles, 20 gross Shoe Polish, 86 Stoves, 3 dozen Wringers, 53 dozen Carpenters' Tools, 8 dozen Bird Cages, 21 dozen Hammers, 30 dozen Edge Tools, 43 Ladders, 21 Tables, 65 Velocipedes, 1 dozen Carpet Sweepers, 30 dozen House-Furnishing Goods, 9 gross Hardware, 10 dozen Carpenters' Tools, 1 dozen Rakes and Hoes, 1 dozen Churns, 24 dozen Tacks, 10 dozen Axes, 80 dozen Edge Tools, 30 dozen Axes, 12 gross Shade Rollers.

By *Isley, Doubleday & Co.*—12 Carriage Tops, 63 Dashers, 60 dozen Couplings and Yokes, 6 dozen Fifth Wheels, 1 case Nails and Buttons, 4 1-6 dozen Castings, 12½ gross Axle Grease, 12½ gross Axle Grease, 5 gross Axle Grease, 224 pounds Glue, 112 pounds Glue, 6½ gross Axle Grease, 8 dozen Paint Brushes, 250 boxes Clothes Pins, 150 dozen Axle Handles.

By *McLean Bros. & Rigg*.—36 dozen Skates, 150 dozen Lamp Chimneys, 8½ dozen Carpet Sweepers, 18 dozen Washboards, 44 dozen Veneer Seats, 2 gross Lemon Squeezers, 2 gross Oil Cans, 60 Lawn Sprinklers, 2 dozen Braces and Drills, 8 dozen Plumbs and Levels, 14 cases Agate-Ware, 4 dozen Meat Choppers, 24 dozen Hatchets, 2 dozen Broad Axes, 2 gross Mop Holders, 3½ dozen Seed Sowers, 25 dozen Axes, 30 dozen Mouse Traps, 18 dozen Hammers, 3 dozen Miter Boxes, 17 dozen Saws, 24 dozen Cow Bells, 2 gross Lemon Squeezers, 1 gross Nutmeg Graters, 12 dozen Stencils, 1 dozen Lemon Squeezers, 24 dozen Curry Combs, 6 dozen Axes, 24 Dozen Axes, 10,000 Clothes Pins, 54 dozen Axes.

By *W. H. Crossman & Bro.*—6 dozen Axes, 7 dozen Picks, 28 dozen Hatchets, 12 dozen Hammers, 19 dozen Hatchets, 2 cases Hardware, 22 dozen Axes, 57 pounds Nails, 78 Dashers, 16 cases Hardware, 6080 pounds Bolts, 40 Scales, 1000 Handles, 38 dozen Axes, 12 dozen Hatchets, 2 dozen Adzes, 1 gross Mop Handles, 60 Corn Mills, 3 gross Traps, 12 dozen Hatchets, 24 dozen Hoes, 20 dozen Axes, 199 packages Carriage-Ware, 18 sets Axes, 400 pairs Boiler Skates, 31 dozen Axes, 6 cases Carpenters' Tools, 2000 feet Rubber Hose, 2 cases Pump Carts, 24 sets Rifle Tools, 3 gross Egg Beaters, 14 cases Hardware, 48 Rifles, 18 sets Tools, 100,000 Primers, 60,000 Cartridges, 32 dozen Axes, 1 gross Mop Handles, 12 dozen Bush Hooks, 6 dozen Hammers, 1056 pounds Nails, 10 dozen Axes, 24 dozen Handles, 3 cases Hardware, 6 dozen Thermometers, 6 dozen Handles, 5 dozen Tools.

PER SCHOONER JOHN F. KRANZ, FEBRUARY 3, 1889, FOR PORT ELIZABETH, SOUTH AFRICA.

By *Coombs, Crosby & Eddy*.—120 dozen Edge Tools, 36 dozen Handles, 1 Grain Mill, 2 Corn Mills, 3 Corn Shellers, 4 Churns, 2 Corn Shellers, 4 dozen Brackets, 5087 pounds Sisal Rope, 4 dozen Wheelbarrows, 10 dozen Hatchets, 20 dozen Shade Rollers, 3 Hay Cutters, 6 Corn Mills, 3 Scales, 54 dozen Handles, 5 dozen Saws, 1 dozen Ladders, 6 dozen Carpenters' Tools, 1 dozen Sprinklers, 4 Plows, 19 dozen Plow Parts, 1 Corn Sheller, 1 dozen Plow Parts, 4 Agricultural Implements, 2 Corn Shellers, 3500 pounds nails, 4 dozen Plow Parts, 43 dozen Hatchets, 6 Grindstones, 40 Plows.

By *R. W. Forbes & Son*.—40 dozen Pick Handles.

By *New Home Sewing Machine Company*.—150 Sewing Machines.

By *J. Norton & Son*.—5243 pounds Cordage, 3 Carriages.

By *Arkell & Douglass*.—6 Stoves, 9 packages Hardware, 7 cases Stuffers, 3000 Primers, 1 case Wire, 1 Forge, 4 dozen Lemon Squeezers, 14 dozen Axes, 30 gross Clothes Pins, 6 Sewing Machines, 17 cases Agricultural Implements, 1 dozen Handles, ¼ dozen Snaths, 2 cases Hoes, ½ dozen Scales, 3 cases Tools, 3 dozen Bench Screws, 1½ dozen Clocks, 6 Tobacco Cutters, 1 Washing Machine, 12 dozen Axes, 15 gross Clothes Pins, 264 pounds Sash Weights, 1 box Hardware, 5 pounds

Sash Cord, ¼ gross Shade Rollers, 9 cases Agricultural Implements, 3 packages Hardware, 15 kegs Nails, 5 dozen Axes, 12 dozen Handles, ½ dozen Corn Mills, 1 dozen Barrows, 6 dozen Picks, 18 Pump Levers, ¼ dozen Grindstones, 1 dozen Grindstones, 30 dozen Picks, 12 kegs Nails, 10 Scales, 33 cases Slates, 1 case Lawn Mowers, 1 case Lamp Goods, 1½ gross Fruit Jars, 11 dozen Hammers, 1 case Harness, 75 cases Axes, 55 kegs Nails, 54 packages Carriage-Ware.

By *H. W. Peabody & Co.*—5400 pounds Nails.

By *W. H. Crossman & Bro.*—6 dozen Handles, 1 barrel Blacking, 26 cases Plow Parts, 42 cases Slates, 4 gross Shade Rollers, 4 cases Sash Weights, 24 pounds Sash Cord, 15 kegs Nails, 9 Store Trucks.

By *Corner Bros. & Co.*—12 dozen Saws, 6 dozen Clocks, 9 dozen Ladders, 1 dozen Corn Shellers, 200 dozen Broom Handles, 16 Plows, 120 dozen Brooms.

PER BARK SERENE, FEBRUARY 5, 1889, FOR PORT NATAL, SOUTH AFRICA.

By *Corner Bros. & Co.*—30 cases Hardware, 6 Wagons, 78 cases Hardware, 158 cases Agricultural Implements, 22 Wagons.

By *Marcial & Co.*—40 dozen Picks, 4 boxes Hatchets, 2 dozen Spading Forks, 3 dozen Hoes.

By *Coombs, Crosby & Eddy*.—500 Broom Handles, 24 dozen Picks, 2 dozen Edge Tools, 195 pounds Oil Stones, 60 dozen Axes, 7 Ladders, 50 pairs Plow Handles, 5 dozen Carpenters' Tools.

By *W. H. Crossman & Bro.*—10 packages Hubs, 12 cases Spokes, 28 bundles Carriage-Ware, 5 cases Hardware, 4 dozen Axes, 2 cases Hardware, 8 dozen Plow Shares, 70 dozen Hatchets, 104 cases Plow Parts, 2 dozen Wringers.

By *Woodhouse & Stortz*.—18 packages Agricultural Implements, 6 packages Axes.

By *H. A. Caesar & Co.*—40 Axes, 112 Plows and Parts, 32 Plows and Parts.

By *H. W. Peabody & Co.*—8 cases Carriage Hardware, 8 cases Agricultural Implements, 8 cases Agricultural Implements, 748 pounds Nails, 2 cases Edge Tools, 228 dozen Handles, 3 cases Stone, 3 cases Brooms, 7 packages Carriages.

By *Strong & Trowbridge*.—1 case Brooms, 2 cases Clothes Pins.

Our Export Methods.

A recent issue of the *Pittsburgh Chronicle* contains the following remarks by M. Morier, a native of France, who has been for many years a resident of Burmah, and is referred to as an extensive traveler and a keen observer. His comments on the American way of doing business are significant, and his suggestions worthy of consideration:

"While Americans are prone to boast of their manufactures," said he, "and rank them as readily superior to those of any other nation, it is painfully apparent, alike to manufacturer, statesman and traveler, that the excellence of American goods has not received proper appreciation away from home. The export trade is distressingly small when compared with the size of this country. The very nations that lie nearest, and which, for geographical reasons, if none other, should be the recipients of the surplus manufactures of the United States, draw the least upon this country for their surplus. Cuba, Mexico and Central America go to England and Belgium for their commodities rather than to the United States, which is not half so far. Brazil, too, and the South American republics satisfy their wants from the storehouses of another hemisphere. As for Africa and India, American trade in those localities is practically nil. American machinery and some articles of Hardware are exported to a limited extent, and are in demand in a few foreign markets, but textile fabrics and articles of domestic use made in the United States are rarely found in the markets of other nations. Even when sent there and exposed for sale they do not readily find purchasers. Cheap prints and calicoes find their way into Cuba and Hayti, and are worn by the poorer classes. But for the finer grade woollens, cottons and silks there is absolutely no demand."

American manufacturers are lacking in enterprise. They must be willing to assume some risk if they want to effect an entrance into foreign markets. Let them study the tastes and needs of the people of other nations, manufacture a special line of goods for them, then put them on the market and be content to wait for the people to find out their worth. We can't expect a Zulu chief to buy a swallowtail coat and patent leather pumps, no matter how fine may be their workmanship. We must cater to his taste. If he wants a scarlet ribbon and an assegai, there is no use in trying to tempt him with a fur-lined overcoat and a

gold-headed cane. If American manufacturers would but take the cue from England and France, and give the Cubans, the Brazilians and the Chileans something they really want, they would soon build up a flourishing trade.

When I first went to India France had but little foothold there. I determined to secure for her some amount of Burmese trade, and accordingly, during my two years' consulate, I made a close investigation of the people's tastes and whims. I studied their favorite colors with great minuteness, carefully noted the quality and form of their garments, and made clippings of every piece of goods that came to hand. I then sent detailed instructions to French manufacturers as to the exact nature of the goods they should produce. The silks were to be in pieces of 10 feet long and 1 broad, and the patterns and texture radically different from anything French looms had ever turned out. They took the hint and set to work. In a short time the importation of French silk into Burmah had gained enormous proportions.

This is but one instance from many. England, Germany and the Netherlands have employed the same methods in building up their trade. They delight the East Indians with the finest and gayest of silks, and find the Libyans and Senegambians equally eager for rough, coarse cotton. American manufacturers are still in the rear because they fail to study the people to whom they cater.

There are still other reasons for our lack of export trade. Americans have no proper means of transporting their goods to foreign countries. In the past century England has given \$250,000,000 to the support of her merchant marine, besides \$100,000,000 to private enterprises. Her vessels carry her products to every quarter of the earth, while Americans are totally lacking in such facilities. If Philadelphia should have lines of her own to Venezuela, Central America and other Southern countries, I believe there would be a very material increase of commerce.

Insufficient means of transportation is generally conceded to be a vital cause for the lack of American export trade, but every one who has studied the question agrees that Americans are too ready to pour old wine into new bottles, and that so long as they neglect to study the tastes of men of other nations they must continue to be shut out from foreign markets.

The charcoal furnace of the Ashland Iron and Steel Company, at Ashland, Wis., is now in good running order, and is fulfilling the expectations of its builders in exceeding the production of any other charcoal furnace in the world. The size of the stack is 65 feet by 12½ feet, and it is equipped with two Whitwell hot-blast stoves. Its output for the week ending February 2 was as follows:

	Tons.
January 27.....	89
January 28.....	86
January 29.....	90
January 30.....	90
January 31.....	100
February 1.....	95
February 2.....	92

Total for the week..... 642

The average daily product was thus nearly 92 tons. On the 5th inst. the production was still larger than on any day above recorded, running up to 104 tons. The owners expect to be able to keep up this remarkable work. M. R. Hunt is now general manager.

Charles A. Ashburner, mining engineer, of Pittsburgh, and also connected with the Fuel, Gas and Electric Engineering Company, Limited, of that city, has gone to Los Angeles, Cal., to examine gas and oil territory in that section owned by George Westinghouse, Jr., and also to examine certain copper mines in the West.

Messrs. Lodge, Davis & Co., manufacturers of iron and brass working machinery, Cincinnati, Ohio, will open March 1, at the corner of Lake and Canal, Chicago, Ill., a depot for the exhibition and sale of their improved engine lathes, shapers, drill presses, planers, milling machines, &c. They will have a full line of tools on hand and will sell them, free on board cars at Chicago, at factory prices. Mr. E. D. Goodwin, who has been connected with their home office for some time, will be in charge.

The Perfection Padlocks.

The accompanying illustration represents the interior mechanism of the Perfection Padlocks, a line of cast bronzed goods put on the market by the Ames Sword Company, Chicopee, Mass. These locks are worked with a double-bitted key, Fig. 2, turning indefinitely both ways. They are made with eight levers, and from their construction are alluded to as not liable to get out of order or to be picked. It will be seen that the small tumbler holds the large one firmly in



Fig. 1.—The Perfection Padlock, Showing Mechanism.

place. When the key is inserted the first movement withdraws the small tumbler and sets the large one free, and, as the key continues to turn, the other side throws back the large tumbler and releases the shackle, which is thrown back by the spring. When the key is withdrawn and the shackle closed the large tumbler is pressed up first by its spring, and then the small one closes up under and holds it firmly. There are eight tumblers, thus

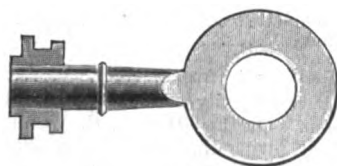


Fig. 2.—Key to Perfection Padlock.

admitting of a great many combinations. These padlocks are made 2½ inch plain, with spring drop staple and 10-inch chain, or with staple spring drop and 10-inch chain, as desired. Two keys are furnished to each lock.

Proctor's Arctic Safety Bail.

The accompanying engraving illustrates a very simple yet effective device to be attached to cooking vessels in place of the usual wire bail, which is apt to get too hot to be touched with the bare hand. The safety bail is a flexible brass chain, made long enough to allow the lid of the vessel to be removed easily. The chain is passed through the ears of the vessel, and linked together to make it endless. In use when cooking the chain lies on the lid of the vessel and does not get hot, as a thick wire bail is very likely to do. The

dotted line in the cut shows the usual position of a wire bail "in the steam." If the cover of the vessel has a knob or tin strap, the cross strand of the chain engages it and prevents it from slipping off, so that the lid can be used as a strainer. The cover is tightly held, so that the solid

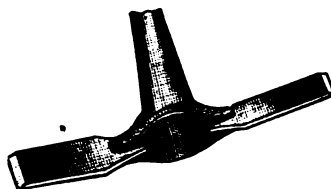


Proctor's Arctic Safety Bail.

contents cannot displace it and fall out. When thus used the safety bail throws the hand so far from the vessel that the heat from it cannot be felt. It is manufactured by Edwin R. Proctor, Gibson House, Cincinnati.

Cronk's Garden Mattock.

This article is represented in the accompanying illustration. It is made by the Cronk Hanger Company, Elmira, N. Y. It is referred to as light, weighing only 1½ pounds, and manufactured of the best hoe steel, with malleable eye and XXX handles. It is recommended by them as



Cronk's Garden Mattock.

superior to a garden hoe for digging burdocks, weeding out and for use in nurseries.

The 6-inch steel gun cast at the Standard Steel Casting Company's works, at Thurlow, Pa., has been successfully tested at the Government proving grounds at Annapolis with 12 rounds, with the full charge of 48½ pounds of prismatic powder and a 100-pound projectile. In this gun the steel was made by the open-hearth process, while the one that burst a few weeks since at the first round was of Bessemer steel. It will require further tests to fully establish the superiority of either method of manufacture.

New Wire Specialties.

The Van Wagoner & Williams Company, 82 Beekman street, New York, have recently added to their line the following wire specialties: Gem Wire Ceiling Hooks, Fig. 1.; Gem Wire Sash Lifts, Fig. 2.; and Gem Wire Door Pulls, Figs. 3 and 4. The ceiling hooks (Fig. 1) have, it will be

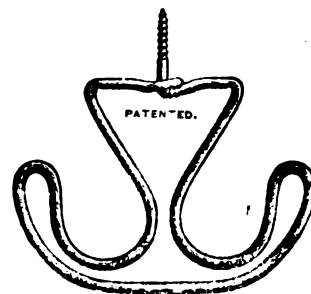


Fig. 1.—Gem Wire Ceiling Hook.

observed, braces on each side of the screw to keep the hook in position when clothes are hung on either side of it. These hooks will sustain a weight of 200 pounds and are referred to as very useful for ward-

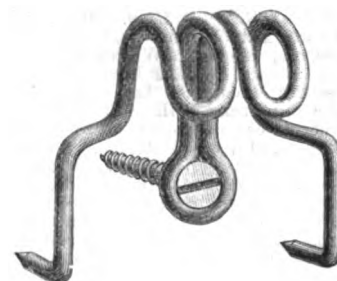


Fig. 2.—Gem Wire Sash Lift.

robes and closets. The wire sash lift shown in Fig. 2 is described as stronger and cheaper than cast iron, while, at the same time, it is more easily applied. These ceiling hooks and sash-fasts are furnished



Fig. 3.—Gem Wire Door Pull, to Drive.

coppered, walnut bronzed, nickel-plated or brass, as desired, and are packed one-half gross in a box, 12 gross in a case. Two patterns of screen-door pulls are represented in Figs. 3 and 4, one of which

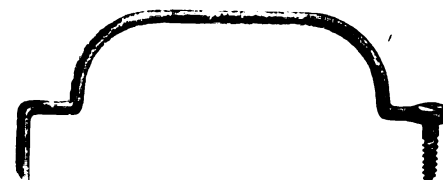
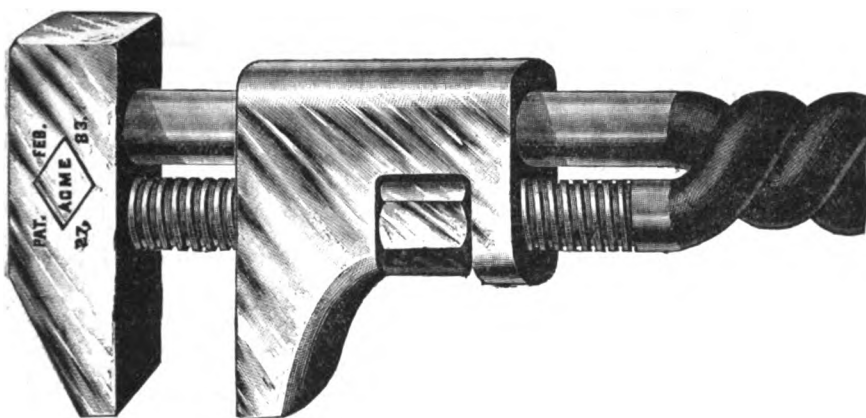


Fig. 4.—Gem Wire Door Pull, to Screw and Drive.

is to drive in the wall; the other, Fig. 4, has one end driven in and the other fastened by a screw.

The Improved Acme Wrench.

The Capitol Mfg. Company, Loomis and Taylor streets, Chicago, have recently made important changes in the construction of the Acme wrench, which is represented in the accompanying illustration. The steel entering into this tool is made specially for the company, and is warranted not to break, bend or spring with ordinary use. The head is drop-forged, and great strength is secured by the double slide. The long nut is alluded to as preventing "stripping" under the most severe strain, and the length of thread gives this wrench a greater capacity than the ordinary screw wrenches. The nut is hexagonal in form instead of circular. The changes which have been made in this wrench are the result of investigations among mechanics with reference to the weak points of wrenches, and the adoption of practical suggestions made by these masters of the bench. The confidence of the company in the excellence of these tools, and their belief that they will meet the most exacting requirements, are thus founded on a practical basis. These wrenches are made in all sizes, from



The Improved Acme Wrench.

5 to 21 inches, inclusive, both bright and nicked. The company's special railroad wrench is made in 12, 15, 18 and 21 inches, and is especially adapted for the heaviest and roughest work. The capacity of the works has recently been doubled, owing to the increased demand for these wrenches.

New B. M. T. Saw.

The new patent tooth B. M. T. Saw, devised by Warren Bundy, Minnesota City, Minn., and manufactured by the Montague-Woodrough Saw Company, 211 and 213 Randolph street, Chicago, Ill., is represented in the accompanying illustration. As shown in the cut, the teeth are arranged in sets of three each and after each set is a recess or gullet for the reception of the sawdust liberated. There are two distinct kinds of teeth in each set, two cutting teeth and one clearing tooth. The cutting teeth are made with the cutting edge on the outer edge of each tooth, and are arranged in step form, with a rise from the body of the saw of about 45°. The cutting edge is on opposite sides in each pair of teeth, so that the bevels face each other, thus making two parallel gashes in the wood. The purpose of the clearing tooth, which is slightly below the points of the cutting teeth and which is formed like a common mortising chisel, with its cutting edge at a right angle to the gash, is to clear away the wood between the two gashes into the recess or gullet before it, thus leaving the next pair of cutting teeth free from obstruction to their work. On drawing the saw back into the gash,

the sawdust is pushed out of the gullet, leaving it clear for the next stroke. The sharp chisel edge of the cutting teeth is referred to as leaving the sides of the wood as smooth as though planed, and, as little set is required, the saving of material is referred to as important, while the ab-



New B. M. T. Saw.

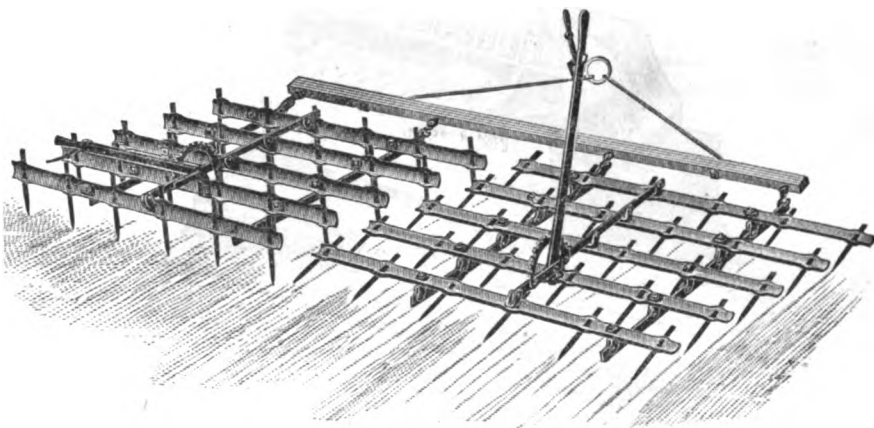
sence of roughness and loose fibers lessens the friction, enabling the saw to work successfully with much less power than the V-tooth saw. With this construction it is claimed that the saw will cross-cut, rip or cut in a miter box with equal facility one-third faster than any saw now

keep in order than others, as with the ordinary teeth it is necessary to file two teeth at a time, making it difficult to have them of exactly the same height, while in this pattern of saw it is explained that, after jointing, the clearing tooth is first filed $\frac{1}{8}$ inch below the level of the cut-

ting teeth, holding the file almost parallel with the blade of the saw and at a slight upward angle, thus clearing the point of the cutting teeth in front and falling below the bevel of the cutting teeth in back. After all the clearing teeth have been filed the cutting teeth are filed to a point one at a time, so that all can be brought to an exact level. When this is done an oilstone laid flat on the side of the saw and run up and down a few times will reduce, it is said, any irregularity in the set and give smooth cutting. The set is given by placing the tooth on a piece of flat steel with a slight bevel on the edge and striking it with the peen of a hammer in such a way as to set only the front or cutting edge, where in the ordinary saw the whole tooth is turned. The company have a special saw-set made for this purpose, which is referred to as doing its work exactly. The circular issued by the company gives a full description of this saw, and illustrates the manner in which it is filed, and the price list.

Weir Steel Bar Lever Harrow.

This harrow, an illustration of which is given below, is manufactured by the Weir Plow Company, Monmouth, Ill. The sections of this harrow cut each 5 feet and 8 inches, and contain each 80 $\frac{1}{4}$ -inch square steel teeth, 10 inches in length. The bars are oval shaped, punched to receive the teeth, which are driven to place



Weir Steel Bar Lever Harrow.

and that no time need be wasted, as at present, by substituting one saw for another. In jig saw work it is stated that the material is cut so smooth that mouldings, &c., are ready for use when they leave the saw. The adaptation of this style of tooth to band saws is also referred to.

It is also pointed out that saws with this pattern of teeth are easier to file and

while the bars are hot, which, contracting, hold them rigid. This is referred to as a very strong, durable and desirable harrow, and, unlike other steel harrows, can be laid flat on the ground without the lever bars on top being doubled and raised above the harrow, making them liable to break and accumulate trash. This harrow is furnished with two, three or four sections, as desired.

Borcherdt's Fishing-Tackle Box.

F. C. Wilson & Co., 239 and 241 Lake street, Chicago, are manufacturing a tin fishing-tackle box which is illustrated herewith. As will be observed, it has a series of pockets, which are the invention of a practical Chicago fisherman named J. C. Borcherdt. These pockets are made of water-proof parchment paper, rein-

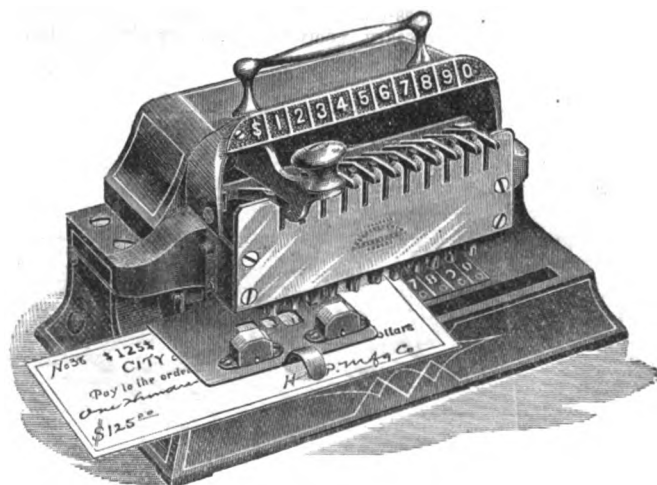


Borcherdt's Fishing-Tackle Box.

forced with tape, and are folded into two pieces of tin, one of which is permanently attached to the cover and the other movably attached by a simple turnbuckle, rendering the contents of the pockets readily accessible. Two sizes are made, the smaller having one tray and the larger three trays, with 16 and 24 pockets respectively. Space is also provided in each for two reels, trolling line, &c.

Lowdon Bank Punch.

This article is put on the market by the Lowdon Bank Punch Company, patentees and proprietors, Kansas City, Mo., for whom it is manufactured by the Hoggson & Pettis Mfg. Company, New Haven, Conn., who are also general Eastern agents. It is designed, as will readily be under-



The Lowdon Bank Punch.

stood, to punch out on the check figures representing the amount for which the check is drawn, in order to prevent fraudulent alterations. The machine consists of an outer frame or casing, in front of which is a row of 11 punches, which may be pressed down through corresponding openings in the steel plate below, which answers as the die. Inside the frame is a small carriage, to which is attached the hand lever shown. To the same carriage is hinged a thin plate, which carries two

small rollers. This plate is pressed down by the action of the spring, and may be lifted by the finger when the paper to be punched is placed under it, where it is held between the two rollers and the third one, which is underneath and is called the feed-roller. This feed-roller is turned slightly during the upward movement of the hand lever, and thus the paper is carried forward sufficiently for the succeeding space. The carriage carrying the lever, the guide and feed rolls can be moved along from side to side, so that the lever when depressed will carry down with it the desired punch. In operation, after the paper has been put in place, the hand lever is moved to the extreme left, and depressed, which punches out the \$ mark. As it rises the paper is automatically moved along for the next space by the rollers, and the lever is then moved to any other desired figure, of course carrying the rolls and the paper along with it. It is again depressed, and the operation is repeated until all the figures are punched out, when it is returned to the left and the \$ mark repeated, to prevent other figures being added. The vertical plate in front has slots in its upper edge, into which the lever fits, and as the upper ends of these slots are enlarged to make the lever enter them easily they serve to center it accurately over the given punch, and thus bring the paper into the exact proper position.

The men employed in the limestone quarries in the Mahoning Valley, Ohio, recently made a demand for an increase of wages, which was refused by the operators, with the result that every quarry in the region has been compelled to suspend operations. It would seem that the demand of the men at this time is unjust, as they are making good wages, and the condition of the iron market does not warrant an advance. It is stated that the men themselves have but little to do with the trouble, but that they are acting under orders from headquarters of the Knights of Labor. We learn that one operator in the New Castle district has granted the advance, but he claims that he was compelled to do so on account of a contract to supply the Rosena Furnace, at New Castle, operated under lease by Oliver

The Muhammad Coffee Biggin.

F. C. Wilson & Co., 239 and 241 Lake street, Chicago, are manufacturing a coffee biggin of new design, for which a patent was issued on the 4th of last December. Perspective and sectional views



Fig. 1.—The Muhammad Coffee Biggin.

of the article are shown herewith. In the sectional view A is the coffee-pot proper, B the percolator cup, C the sleeve, *b b* lugs, D perforated cone strainer, E perfor-

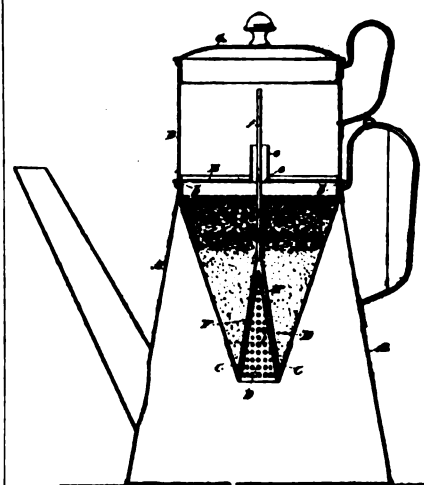


Fig. 2.—Muhammad Coffee Biggin, Sectional View.

ated diaphragm, F hood fitting over D, G cover fitting pot and percolator, *f* rod for raising hood F. The flow of water through the coffee is regulated by raising or lowering the hood F, and it is claimed that this is the only biggin in which the flow can be regulated so as to thoroughly reach the coffee. This coffee-pot holds 3 quarts, but is, at the same time, so constructed that two or three cups may be made in it with equal facility to the larger quantity.

Milwaukee capitalists have organized a company to prospect for natural gas at Oak Creek, near Racine, Wis. Gas is flowing quite heavily from a well 120 feet deep, and it is proposed to sink another in a better location not far away. The entire farm has been leased on which the discovery was made, and considerable excitement has been caused among the residents of the immediate vicinity.

CURRENT HARDWARE PRICES.

FEBRUARY 13, 1889.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers' name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers, at the figures named.

Ammunition.—

Caps, Percussion, 1000—	
Hicks & Goldmark's	
F. L. Waterproof, 1-10's.....	50¢
E. B. Trimm'd Edge, 1-10's.....	55¢
E. B. Grnd. Edge, Cent. Fire.....	25¢
Double Waterproof, 1-10's.....	75¢
Market Waterproof, 1-10's.....	50¢
G. D.....	25¢
S. B.....	30¢

Union Metallic Cartridge Co.	
F. C. Trimm'd.....	50¢
F. L. Ground.....	25¢
Cent. Fire Ground.....	75¢
Dbl. Waterproof.....	1.40
Dbl. Waterproof, 1-10's.....	1.40
Eley's E. B.....	45¢
Eley's D Waterproof, Central Fire.....	1.00

Cartridges	
Rim Fire Cartridges.....	50¢
Rim Fire Military.....	15¢
Cent. Fire, Pistol and Rifle.....	25¢
Cent. Fire, Military and Sporting.....	15¢

Blank Cartridges, except 22 and 32 cal., additional 10¢ on above discount	
Blank Cartridges, 22 cal.....	1.75, dis 2¢
Blank Cartridges, 32 cal.....	3.50, dis 2¢
Primed Shells and Bullets.....	15¢
B. B. Caps, Round Ball.....	1.75, dis 2¢
B. B. Caps, Con. Ball, Swgd.....	2.00, dis 2¢

Primers	
Berdan Primers.....	1.00, dis 2¢
B. L. Caps (for Sturtevant Shells).....	1.00, dis 2¢
All other Primers.....	1.50, dis 2¢

Shells	
First quality, 4, 8, 10 and 12 gauge.....	25¢
First quality, 14, 16 and 20 gauge (10 list).....	30¢
Star, Club, Rival and Climax brands, 10 and 12 gauge.....	35¢

Club, Rival and Climax brands, 14, 16 and 20 gauge.....	35¢
Seibold's Comb. Shot Shells.....	15¢
Brass Shot Shells, 1st quality.....	60¢
Brass Shot Shells, Club, Rival, Climax.....	65¢
I. X. L., 10 and 12 gauge.....	40¢
"Special," 16 gauge.....	30¢
"Special," 10 and 12 gauge.....	40¢
Fowler's Pat.....	35¢

Shells Loaded—	
A. M. Co. List No. 12, 1887.....	20¢
U. M. C. & W. R. A.—B. E., 11 up.....	32.00
U. M. C. & W. R. A.—B. E., 9 to 10.....	2.30
U. M. C. & W. R. A.—B. E., 7 to 8.....	2.60
U. M. C. & W. R. A.—P. E., 11 up.....	2.10
U. M. C. & W. R. A.—P. E., 9 to 10.....	4.00
U. M. C. & W. R. A.—P. E., 7 to 8.....	4.90
Eley's B. E., 11 up.....	1.75
Eley's P. E., 11 up.....	2.80

Anvils—	
Regis Anvils.....	10¢, dis 30¢
Peter Wright's.....	9¢
Armstrong's Mouse Hole.....	5¢
Armstrong's Mouse Hole, Extra.....	11¢
Trenton.....	10¢
Wilkinson's.....	11¢
J. & Bailey Carr. Bolt.....	11¢
Moore & Barnes Mfg. Co.....	85¢

Anvil Vice and Drill—	
Millers Falls Co.....	1.00, dis 30¢
Chester Anvil and Vice.....	25¢
Allen Combined Anvil and Vice.....	35.00, dis 40¢

Apple Parers—	
Advances.....	5¢
Adams Combination.....	5.50
Baldwin.....	5.25
Champion.....	5.25
Eureka, 1888.....	17.00
Family Bay State.....	5.25
Gem.....	5.25
Gold Medal.....	4.00
Hudson's New '88.....	3.75
Ideal.....	4.75
Improved Bay State.....	30.00
Little Star.....	15.00
Monarch.....	5.50
New Lightning.....	4.00
Orion.....	4.00
Penn.....	4.00
Perfection.....	4.00
Pomona.....	4.00
Rocking Table.....	6.00
Turntable.....	18.50
Victor.....	4.50
White Mountain.....	4.50
72.....	4.25
75.....	5.75
76.....	5.50

Augers and Bits—	
Douglas Mfg. Co.....	70¢
Wm. A. Ives & Co.....	70¢
Humphreysville Mfg. Co.....	55¢
French, Swift & Co. (F. H. Beecher).....	55¢
Cook's, Douglas Mfg. Co.....	55¢
Cook's, N. H. Copper Co.....	50¢
Ives' Circular Lip.....	80¢
Patent Solid Head.....	30¢
C. E. Jennings & Co., No. 10, extension.....	40¢
Up.....	30¢
C. E. Jennings & Co., No. 30.....	40¢
C. E. Jennings & Co., Auger Bits, 1/2 set.....	30¢
3/4 quarters, No. 5, 35; No. 30, 35, dis 20¢	
Lewis' Patent Single Twist.....	45¢
Jennings' Augers and Bits.....	25¢
Imitation Jennings' Bits.....	60¢
Pugh's Black.....	60¢
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Cook's, Douglas Mfg.	

Cards— Horse & Curry..... 10¢10¢10¢10¢ Cotton..... New list, Aug., 1888, 10¢10¢10¢ Wool..... New list, Aug., 1888, 10¢10¢10¢	Card Spring Bar Clips, 5-16..... 50¢ Wrought-Iron Felloe Clips..... 50¢ Steel Felloe Clips..... 50¢ Baker Axle Clips..... 50¢ Cockeyes..... 50¢ Cocks, Brass..... 40. & 10¢2¢ Hardware list..... Coffee Mills— Box and Side, List revised Jan. 1, 1888, 50¢2¢ American, Enterprise Mfg. Co. 20¢10¢30¢ The "Swift," Lane Bros..... 20¢10¢	Drill Chucks.—See Chucks. Dripping Pans— Small sizes..... 7¢ 0¢4¢ Large sizes..... 7¢ 0¢4¢ Egg Beaters. Dover..... doz \$1.50 National..... doz \$4.50, dis 35¢4¢ Family (T. & S. Mfg. Co.), doz \$17.00¢15.00 Duplex (Standard Co.)..... doz \$15.00 Rival (Standard Co.)..... doz \$12.00 Large Duplex (Standard Co.), doz \$4.50 Triumph (T. & S. Mfg. Co.), doz \$11.50 Advance, No. 1..... doz \$10.50 Advance, No. 2..... doz \$10.00 Bryant's..... doz \$15.00 Ayres' Spiral..... doz \$5.00 Double (H. & R. Mfg. Co.)..... doz \$16.20 Easy (H. & R. Mfg. Co.)..... doz \$14.00 Triple (H. & R. Mfg. Co.)..... doz \$18.20 Spiral (H. & R. Mfg. Co.)..... doz \$4.50 Paine, Diehl & Co.'s..... doz \$24.00 Egg Poachers— Buffalo Steam Egg Poachers, doz, No. 1, \$5.00; No. 2, \$9.00, dis 25¢ Electric Bell Sets.— Wellensak's..... 20¢ Bigelow & Downe..... 20¢ Emery—No. 4 to No. 54 to Flour, CF Kegs, 46 gr. 150 gr. F FF..... 2 11 50 4 kegs, 46 gr. 150 gr. F FF..... 2 11 50 4 kegs, 46 gr. 150 gr. F FF..... 2 11 50 10 lb cans, 10..... 6 5¢ in case..... 6 5¢ 10 lb cans, less than 10..... 10 7 1/2¢ Enameled and Tinned Ware— See Hollow Ware. Escutcheon Pins— Iron, list Nov. 11, 1888..... 50¢10¢50¢10¢5¢ Brass..... 60¢10¢5¢	Forks— Hay, Manure, &c., Asso. List..... 65¢ Hay, Manure, &c., Phila. List..... 60¢60¢25¢ Plated, see Spoons. Freezers, Ice Cream— Buffalo Champion..... 60¢10¢25¢ Shepard's Lightning..... 65¢ White Mountain..... 60¢ Fruit and Jelly Presses— Enterprise Mfg. Co..... 20¢10¢30¢ Henis..... doz \$3.75¢4.00 P. D. & Co..... doz \$3.75¢4.00 Shepard's Queen City..... 40¢ Fry Pans— High List..... 75¢5¢75¢10 No..... 1 2 3 4 5 doz \$3.75 \$4.70 \$5.30 \$5.95 \$6.55 No..... 5 6 7 8 doz \$7.50 \$8.75 \$10.00 \$11.25 Low List..... 65¢10¢ No..... 0 1 2 3 4 doz \$3.00 \$3.75 \$4.25 \$4.75 \$5.25 No..... 5 6 7 8 doz \$3.00 \$3.75 \$4.25 \$4.75 \$5.25 Fuse— 1000 ft. Common Hemp Fuse, for dry ground..... \$2.70 Common Cotton Fuse, for dry ground..... 2.85 Single Taped Fuse, for wet ground..... 4.75 Double Taped Fuse, for very wet gr..... 6.00 Triple Taped Fuse, for very wet gr..... 7.35 Small Gutta Percha Fuse, for water..... 7.50 Large Gutta Percha Fuse, for water..... 13.00 Gauges— Marking, Mortise, &c..... 60¢10¢ Starrett's Surface, Center and Scratch..... 25¢10¢ Wire, low list..... 10¢10¢ Wire, Wheeler, Madden & Co..... 10¢ Wire, Morse's..... 50¢50¢25¢ Wire, Brown & Sharpe's..... 10¢30¢ Gimlets— Nail and Spike..... 50¢10¢25¢ "Eureka" Gimlets..... 40¢10¢ "Diamond" Gimlets..... gr \$5.00 Double Cut, Shepardson's..... 45¢45¢5¢ Double Cut, Ives..... 60¢40¢25¢ Double Cut, Douglass..... 40¢10¢ "Bee"..... gr \$12, dis 25¢25¢25¢ Glue— Le Page's Liquid..... 25¢25¢25¢ Upton's Liquid..... 35¢ Le Page & Co.'s Improved Process..... 25¢25¢25¢ Glue Pots— Tinned..... 40¢ Enameled..... 40¢45¢ Family, Howe's "Eureka"..... 40¢ Family, L. F. C.'s "Handy"..... 50¢ Grindstones— Small, at factory..... ton \$7.50¢9.00 Grindstone Fixtures— Sargent's Patent..... 70¢10¢ Reading Hardware Co..... 30¢10¢ Hack Saws.— See Saws. Halters— Covert's, Rope, ¼-in. Jute..... 50¢25¢ Covert's, Rope, ½-in. Hemp..... 40¢25¢ Covert's Adj. Rope Halters..... 40¢25¢ Covert's Hemp Horse and Cattle Tie..... 50¢25¢ Covert's Jute Horse and Cattle Tie..... 60¢10¢25¢ Hammers— Handled Hammers— Maydole's, list Dec. 1, '85..... 25¢25¢10¢ Buffalo Hammer Co..... list Jan. 15, '87 Humason & Beckley..... 50¢50¢10¢ Atha Tool Co..... 40¢10¢50¢ Fayette R. Plumb..... 40¢10¢50¢ C. Hammond & Son..... 40¢10¢50¢ Verree..... 40¢10¢50¢ Magnetic Tack, Nos. 1, 2, 3, \$1.25, 1.50, 1.75 Nelson Tool Works..... 40¢10¢ Warner & Nobles..... 20¢25¢ Peck, Stow & Wilcox..... 40¢ Sargent's..... 35¢10¢ Heavy Hammers and Sledges— 3 lb and under..... doz \$4.00 dis 60¢10¢ 3 to 5 lb..... doz \$3.00 dis 60¢10¢ Over 5 lb..... doz \$3.00 dis 60¢10¢ Wilkinson's Smiths..... 10¢4¢11¢ Handcuffs and Leg Irons— Providence Tool Co., Handcuffs..... \$15.00 doz..... dis 10¢ Providence Tool Co., Leg Irons..... \$25.00 doz..... dis 10¢ Tower's..... 25¢ Daley's Improved Handcuffs: 2 Hands..... doz \$4.00 Polished, doz \$48.00; Nickel..... \$57.00 3 Hands, Polished, doz \$72.00; Nickel..... \$84.00 Handles— Iron, Wrought or Cast— Door or Thumb..... No..... 1 2 3 4 Per doz..... \$0.90 1.00 1.18 1.35 1.50 Roggin's Latches..... doz \$0.30¢35¢ Bronze Iron Drop Latches..... doz 70¢ net Jap'd Store Door Handles—Nuts, \$1.02; Plate, \$1.10; no Plate, \$0.88..... net Barn Door..... doz \$1.40, dis 10¢10¢ Chest and Lifting..... 70¢ Handles, Wood— Saw and Plane..... 40¢10¢40¢10¢5¢ Hammer, Hatchet, Axe, Sledge, &c..... 40¢ Brad Axl..... gr \$2.00 Hickory Firmer Chisel, ass'd..... gr \$1.00 Hickory Firmer Chisel, large..... gr \$5.00 Apple Firmer Chisel, ass'd..... gr \$5.00 Apple Firmer Chisel, large..... gr \$6.00 Socket Firmer Chisel, ass'd..... gr \$8.00 Socket Framing Chisel, ass'd..... gr \$6.00 J. S. Smith & Co.'s Pat File..... 50¢ File, assorted..... gr \$2.75, dis 40¢ Auger, assorted..... gr \$5.00 Auger, large..... gr \$7.00 Pat. Auger, Ives..... 30¢10¢ Pat. Auger, Douglass..... set \$1.25 net Pat. Auger, Swan's..... set \$1.00 net Hoe, Rake, Shovel, &c..... 50¢
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Cross-Cut Saw Handles—
 Atkins' No. 1 Loop, pair, 30¢; No. 2, 25¢; No. 2 and No. 4 Reversible, 22¢.
 Boynton's Loop Saw Handles, 50¢, dis 60¢
 Champion.....15¢

Hangers—
 Barn Door, old patterns.....60¢10¢10¢70¢
 Barn Door, New England.....60¢10¢10¢70¢
 Samsen Steel Anti-Friction.....55¢
 Orleans Steel.....55¢
 Hamilton Wrought Wood Track.....55¢
 U. S. Wood Track.....55¢
 Champion.....60¢10¢
 Rider and Wooster, Medina Mfg. Co.'s
 List.....70¢
 Climax Anti-Friction.....55¢
 Climax Steel Anti-Friction.....50¢
 Zenith for Wood Track.....55¢
 Reed's Steel Arm.....50¢
 Challenge, Barn Door.....50¢
 Sterling's Improved (Anti-Friction).....60¢10¢
 Victor, No. 1, \$15.00; No. 2, \$10.50; No. 3, \$10.00.....50¢10¢
 Cheritree.....50¢10¢
 Kidder's.....50¢10¢
 The "Boss".....60¢
 Best Anti-Friction.....60¢
 Duplex (Wood Track).....60¢
 Terry's Pat., 7 dos pr. 4 in. \$10.00; 5 in. \$12.00.....50¢10¢
 Cronk's Pat., No. 4, \$12.00; No. 5, \$14.00; No. 6, \$18.00.....50¢10¢
 Wood Track Iron Clad, 7 ft. 10¢, dis 60¢
 15¢10¢

Carrier Steel Anti-Friction—
 Architect.....50¢10¢
 Eclipse.....30¢10¢
 Felix.....50¢10¢
 Richards.....50¢10¢
 Lane's Steel Anti-Friction.....40¢10¢
 Ball Bearing Door Hanger.....20¢10¢
 Warner's Pat.....20¢10¢
 Stearns' Anti-Friction.....20¢10¢
 Stearns' Challenge.....25¢10¢
 Faulkner.....25¢10¢
 American.....50¢10¢
 Rider & Wooster, No. 1, 62¢; No. 2, 75¢.....40¢
 Paragon, Nos. 1, 2 and 3.....40¢10¢
 Paragon, Nos. 5, 6, 7 and 8.....20¢10¢
 Crescent.....60¢10¢
 Nickel, Cast Iron.....50¢
 Nickel, Malleable.....50¢
 Scranton Anti-Friction Single Strap.....35¢
 Scranton Anti-Friction Double Strap.....40¢
 Universal Anti-Friction.....40¢
 Wild West, 4 in. Wheel, \$15.00; 5 in. Wheel, \$21.00.....40¢10¢
 Star.....40¢10¢
 May.....50¢10¢
 Barry, \$5.00.....40¢10¢

Harness Snaps—
 See Snaps.
Hatchets—
 List Jan. 1, 1886.....35¢40¢
 Isaiah Blood.....35¢40¢
 Hunt's Shingling, Lath and Claw.....40¢25¢
 Hunt's Broad.....40¢
 Buffalo Hammer Co.....40¢10¢
 Hurd's.....40¢10¢
 Fayette B. Plumb.....40¢10¢
 Wm. Mann, Jr.....40¢10¢
 Underhill Edge Tool Co.....40¢10¢
 Underhill's, Haines and Bright.....35¢
 C. Hammond & Son.....40¢10¢
 Simmons.....40¢10¢
 Peck's.....40¢10¢
 Kelly's.....50¢10¢
 Sargent & Co.....50¢10¢
 Ten Eyck Edge Tool Co.....40¢10¢
 Collins.....10¢
Hay and Straw Knives—
 Lightning.....Mfrs' price 7 dos \$18.00, dis 25¢
 Electric.....7 dos \$17, dis 30¢30¢5¢
 Gem.....7 dos \$10, dis 30¢30¢5¢
 Wadsworth's.....40¢10¢
 Carter's Needle.....7 dos \$12.50, dis 10¢
 Heath's.....7 dos \$13.50, dis 14.00
 Auburn Hay, Common and Spear Point.....50¢
 Auburn, Straw.....40¢
Hinges—
Wrought Iron Hinges
 Strap and T.....75¢75¢5¢
 Screw Hook and Strap.....14 to 30 in., 7 dos.....34¢
 Heavy Welded.....14 to 30 in., 7 dos.....34¢
 Hook.....14 to 30 in., 7 dos.....34¢
 Screw Hook.....14 in., 7 dos \$1.50, dis 10¢
 and Eye.....14 in., 7 dos \$3.50, dis 10¢
 Rolled Blind Hinges, Nos. 32 and 34.....50¢10¢
 Rolled Blind Hinges, Nos. 232 and 234.....50¢10¢
 Rolled Plate.....70¢10¢
 Rolled Raised.....70¢10¢
 Plate Hinges, 8, 10 & 12 in., 7 dos.....34¢
 "Providence" over 12 in., 7 dos.....34¢
Spring Hinges—
 Geor's Spring and Blank Butts.....40¢
 Union Spring Hinge Co.'s List, March, 1886.....30¢
 Acme and U. S.....30¢
 Empire and Crown.....30¢
 Hero and Monarch.....50¢
 American, Gem, and Star, Japanese.....50¢
 American, Gem, and Star, Bronzed.....50¢
 Oxford, Bronze and Brass.....50¢
 Barker's Double Acting.....30¢10¢
 Union Mfg. Co.....25¢
 Bommer's.....30¢
 Buckman's.....15¢20¢
 Chicago.....30¢
 Wiles.....10¢
 Devore's.....40¢
 Rex.....40¢

Gate Hinges—
 Western.....7 dos \$4.40, dis 60¢
 N. E.....7 dos \$7.00, dis 60¢
 N. E. Reversible.....7 dos \$5.20, dis 55¢10¢
 Clark's, Nos. 1, 2, 3.....60¢10¢5¢
 N. Y. State.....7 dos \$5.00, dis 55¢10¢
 Automatic.....7 dos \$12.50, dis 50¢
 Common Sense.....7 dos \$4.50, dis 50¢
 Seymour's.....45¢10¢
 Shepherd's.....60¢10¢
 Reed's Latch and Hinges.....7 dos \$12.00, dis 50¢

Blind Hinges—
 Parker.....75¢2¢
 Palmer.....50¢5¢10¢
 Seymour.....70¢2¢
 Nicholson.....45¢10¢
 Huffer.....50¢
 Clark's, Nos. 1, 3, 5, 40 and 50.....75¢10¢5¢80¢

Clark's Mortise Gravity—
 Sargent's, Nos. 1, 3, 5, 11, 13.....75¢10¢75¢10¢5¢
 Sargent's, No. 12.....75¢10¢10¢
 Reading's Gravity.....75¢10¢75¢10¢5¢
 Shepard's Noiseless Niagara Buffalo, Champion, Steamboat, Clark's Old Pattern and Clark's Tip Pattern.....75¢10¢5¢
 Shepard's O. S., Lull & Porter.....75¢10¢
 Shepard's Acme, Lull & Porter.....75¢10¢
 Shepard's Queen City Reversible.....75¢
 Clark's Lull & Porter, Nos. 0, 1, 11, 2, 2 1/2, 8.....75¢10¢2 1/2¢
 North's Automatic Blind Fixtures, No. 2, for Wood, \$10.50; No. 3, for Brick, \$13.50.....25¢2¢

Hees—
Handled—
 Garden, Mortar, &c.....65¢
 Planter's, Cotton, &c.....65¢
 Warren Hoe.....60¢
 Magic.....7 dos \$4.00
Eye—
 D. & H. Scovill.....20¢
 Lane's Crescent Planter's Pattern.....45¢5¢
 Lane's Razor Blade, Scovill Pattern.....30¢
 Maynard, S. & O. Pat.....45¢5¢
 Sandusky Tool Co., S. & O. Pat.....60¢
 Hubbard & Co., S. & O. Pat.....60¢
 Chattanooga Tool Co., S. & O. Pat.....60¢10¢
 Grub.....60¢10¢

Hog Rings and Ringers—
 Hill's Improved Ringers.....7 dos \$4.50
 Hill's Old Style Ringers.....7 dos \$3.00
 Hill's Tongue.....7 dos \$4.50
 Hill's Rings.....7 dos bxs \$3.25, 2.40
 Perfect Rings.....7 dos bxs \$1.75, 2.00
 Perfect Ringers.....7 dos \$2.50
 Blair's Hog Ringers.....7 dos \$2.50, 2.55
 Blair's Hog Ringers.....7 dos \$5.00, 1.00
 Champion Ringers, Double.....7 dos \$2.25
 Brown's Ringers.....7 dos \$2.00
 Brown's Ringers.....7 dos \$1.25, 1.30

Hoisting Apparatus—
 "Moore's" Hand Hoist, with Lock Brake.....20¢
 "Moore's" Differential Pulley Block.....40¢
 Energy Mfg. Co.'s.....25¢

Holders, File and Tool—
 Balz Pat.....7 dos \$4.00, dis 25¢
 Nicholson File Holders.....20¢

Hollow-Ware—
Iron—
 Stove Hollow-Ware—
 Ground.....60¢10¢5¢
 Unground.....60¢10¢60¢10¢10¢
 Enamelled Hollow-Ware.....65¢10¢
 Maslin Kettles.....65¢10¢
 Boilers and Saucepans.....40¢5¢
 Tinned Boilers and Saucepans.....40¢
 Gray Enamelled-Ware—
 Stove.....50¢50¢25¢
 Maslin Kettles.....60¢10¢60¢10¢10¢
 Boilers and Saucepans.....40¢5¢
 Agate and Granite Ware.....50¢50¢25¢
 Rustless Hollow-Ware.....50¢50¢25¢
 Galvanized Tea-Kettles—
 Inch.....6 7 8 9
 Each.....55¢ 60¢ 65¢ 75¢
 4 mo. or 5¢ cash in 30 days.

Silver Plated—
 Reed & Barton.....55¢10¢
 Meriden Britannia Co.....55¢10¢
 Simpson, Hall, Miller & Co.....40¢5¢
 Rogers & Brother.....40¢5¢
 Hartford Silver Plate Co.....40¢5¢5¢
 William Rogers Mfg. Co.....40¢5¢5¢

Hooks—
Cast Iron—
 Bird Cage, Sargent's List.....60¢10¢10¢
 Bird Cage, Reading.....60¢10¢10¢
 Clothes Line, Sargent's List.....60¢10¢10¢
 Clothes Line, Reading List.....60¢10¢10¢10¢
 Ceiling, Sargent's List.....55¢10¢10¢
 Harness, Reading List.....55¢10¢10¢
 Coat and Hat, Sargent's List.....55¢10¢60¢10¢
 Coat and Hat, Reading.....50¢10¢60¢10¢10¢
Wrought Iron—
 Cotton.....7 dos \$1.25
 Cotton Pat. (N.Y. Mallet & Handle Wks.).....30¢
 Tassel and Picture (T. & S. Mfg. Co.).....50¢
 Wrought Pictures, Hooks, &c.....See Wrought Goods.

Wire—
 Wire Coat and Hat, Gem, List April, 1886.....45¢
 Wire Coat and Hat, Miles, List April, 1886.....45¢
 Indestructible Coat and Hat.....45¢
 Wire Coat and Hat, Standard.....45¢
 Belt.....75¢10¢30¢

Miscellaneous—
 Grass, No. 2, \$2.00; No. 3, \$2.35; No. 4, \$2.50.....55¢90¢
 Bush.....55¢90¢
 Whitetree—Patent.....55¢
 Hooks and Eyes—Malleable Iron.....70¢70¢10¢
 Hooks and Eyes—Brass.....60¢10¢10¢
 Fish Hooks, American.....50¢
 Bench Hooks.....See Bench Stops.

Horse Nails—
 Nos. 6 7 8 9 10
 Ausable.....25¢ 26¢ 25¢ 24¢ 23¢
 25¢10¢25¢10¢10¢
 Clinton, Fin.....24¢ 22¢ 21¢ 20¢ 19¢
 Essex.....25¢ 26¢ 25¢ 24¢ 23¢
 25¢10¢25¢10¢10¢
 Lyra.....25¢ 23¢ 22¢ 21¢ 20¢
 Snowden.....25¢ 23¢ 22¢ 21¢ 20¢
 Putnam.....23¢ 21¢ 20¢ 19¢ 18¢
 1000 m in year dis 15¢
 Vulcan.....23¢ 21¢ 20¢ 19¢ 18¢
 Northwest.....25¢ 23¢ 22¢ 21¢ 20¢
 Globe.....23¢ 21¢ 20¢ 19¢ 18¢
 Boston.....23¢ 21¢ 20¢ 19¢ 18¢
 A. C.....25¢ 23¢ 22¢ 21¢ 20¢
 C. B. K.....25¢ 23¢ 22¢ 21¢ 20¢
 Champlain.....25¢ 26¢ 25¢ 24¢ 23¢

New Haven.....25¢ 26¢ 25¢ 24¢ 23¢
 Sarnac.....25¢ 21¢ 20¢ 19¢ 18¢
 Champion.....25¢ 23¢ 22¢ 21¢ 20¢
 Capewell.....25¢ 26¢ 25¢ 24¢ 23¢
 Star.....23¢ 21¢ 20¢ 19¢ 18¢
 Anchor.....23¢ 21¢ 20¢ 19¢ 18¢
 Western.....23¢ 21¢ 20¢ 19¢ 18¢
 Empire Bronzed.....14¢
Horse Shoes—See Shoes Horse.

Hose, Rubber—
 Competition.....75¢10¢75¢10¢5¢
 Standard.....70¢70¢10¢
 Extra.....60¢60¢10¢
 N. Y. B. & P. Co., Extra.....50¢
 N. Y. B. & P. Co., Dundee.....60¢10¢5¢

Huskers—
 Blair's Adjustable.....7 gr \$8.00
 Blair's Adjustable Clipper.....7 gr 7.00

Indurated Fiber-Ware.
 Spittoons, No. 2, 7 dos.....\$2.75
 Basins, Ringed, 7 dos., No. 1, \$3.00; No. 2, \$3.00; No. 3, \$2.70
 Washbuds, Nested, Nos. 0, 1, 2 and 3 (4 pieces), 7 dos. nests.....\$16.87
 Keelers, Nested, Nos. 1, 2, 3 and 4 (4 pieces), 7 dos. nests.....\$8.37
 Butter Bowls, 15, 17 and 19-inch (3 pieces), 7 dos. nests.....\$6.75
 Liquid Measures, qt., qt. 1/2, and pint (4 pieces), 7 sets.....\$3.00
 Dry Measures, 1, 2, 4, 8 and 16 qts. (5 pieces), 7 sets.....\$2.25
 See also *Patls.*

Jack Screws—See Screws.
Kettles—
 Brass, 7 to 17 in., 7 dos.....24¢ 21¢
 Brass larger than 17 in.....26¢ 23¢
 Enamelled and Tea Kettles.....See *Hollow-Ware.*

Keys—
 Lock Ass'n List Dec. 30, 1886.....50¢10¢
 Eagle, Cabinet, &c.....35¢25¢
 Hotchkiss' Brass Blanks.....40¢
 Hotchkiss' Copper and Tinned.....40¢
 Hotchkiss' Pad, and Cab.....35¢
 Ratchet Bed Keys.....7 dos \$4.00, dis 15¢
 Wollensak Tinned.....50¢10¢

Knife Sharpeners—
 Pardin's Applewood Handles.....7 dos \$3.00, dis 40¢
 Pardin's Rosewood or Cocobolo.....7 dos \$3.00, dis 40¢

Knives—
 Wilson's Butcher Knives.....25¢30¢
 Ames' Butcher Knives.....25¢
 Foster Bros' Butcher, &c.....40¢
 Nichols' Butcher Knives.....40¢10¢
 Ames' Shoe Knives.....15¢20¢
 Ames' Bread Knives.....15¢20¢
 Moran's Shoe and Bread.....20¢
 Hay and Straw.....See Hay Knives.
 Table and Pocket.....See Cutlery.
 Corn, Auburn Mfg. Co. Western Pat.....\$2.00
 Corn, Auburn Mfg. Co. Crescent.....\$3.50

Knobs—
 Door Mineral.....65¢68¢
 Door Por. Jap'd.....75¢78¢
 Door Por. Nickel.....\$2.00, 2.25
 Door Por. Plated Nickel.....\$2.00, 2.25
 Drawer, Porcelain.....60¢10¢60¢10¢10¢
 Hemacite Door Knobs.....40¢10¢50¢
 Yale & Towne Wood, List Dec., 1886.....40¢
 Furniture, Plain.....75¢ gro inch, dis 10¢
 Furniture, Wood Screws.....25¢10¢
 Base, Rubber Tip.....70¢10¢5¢
 Picture, Judge.....60¢10¢10¢70¢
 Picture, Sargent's.....70¢10¢
 Picture, Hemacite.....35¢5¢
 Shutter, Porcelain.....65¢10¢
 Carriage, Jap.....7 gro 80¢, dis 60¢10¢

Ladies—
 Melting, Sargent's.....55¢10¢
 Melting, Reading.....35¢10¢
 Melting, Monroe's Pat.....7 dos \$4.00, dis 40¢
 Melting, P. S. & W.....35¢10¢40¢
 Melting, Warner's.....30¢

Lawn Mowers—
 Standard List.....50¢10¢
 Quaker City.....dis 60¢10¢
 Enterprise.....60¢10¢

Lanterns—
Tubular—
 Plain with Guards, 7 dos.....\$4.00, 4.25
 Lift Wire, with Guards.....\$4.50, 4.75
 Square Plain, with Guards.....\$4.00, 4.25
 Sq. Lift Wire, with Guards.....\$4.25, 4.50
 Without Guards, 25¢ 7 dos less.

Miscellaneous—
 Police, Small.....\$6.00; Medium, \$7.25; Large, \$9.75.....dis 20¢25¢
Lemon Squeezers—
 Porcelain Lined, No. 1, 7 dos \$6.00, dis 25¢30¢
 Wood, No. 2.....7 dos \$3.00, dis 25¢
 Wood, Common.....7 dos \$1.70, 1.75
 Dunlap's Improved.....7 dos \$3.75, dis 20¢
 Sammls.....No. 1, \$5.00; No. 2, \$3.12; \$18 7 dos.....dis 25¢10¢
 Jennings "Star".....7 dos \$2.50
 The "Boss".....7 dos \$2.50
 Dean's, Nos. 1, 7 dos \$6.50; 2, \$3.35; 3, \$1.90
 Little Giant.....50¢50¢5¢
 King.....40¢25¢

Lines—
 Cotton and Linen Fish, Draper's.....50¢
 Draper's Chalk.....60¢
 Draper's Mason's Linen, 84 ft., No. 1, \$1.25; No. 2, \$1.75; No. 3, \$2.25; No. 4, \$2.75; No. 5, \$3.25.....dis 25¢
 Cotton Chalk.....65¢
 Samson, Cotton, No. 4, \$2; No. 4 1/2, \$2.50; No. 5, \$3.....dis 10¢
 Silver Lake, Braided, No. 0, \$6.00; No. 1, \$6.50; No. 2, \$7.00; No. 3, \$7.50; No. 4, \$8.00; No. 5, \$8.50.....dis 25¢
 Mason's Linen, No. 3 1/2, \$1.50; No. 4, \$2.00; No. 4 1/2, \$2.50.....dis 45¢
 Mason's Colored Cotton.....45¢
 Wire Clothes, No. 18, \$3.00; No. 19, \$3.00; No. 20, \$2.50

Ventilator Cord, Samsen Braided, White or Drab Cot., 7 dos \$7.50, dis 20¢

Locks, &c.—
Door Locks, Latches, &c.
 List Dec. 30, '86, chgd Feb. 2, '87, dis 50¢10¢60¢5¢
 Mallory, Wheeler & Co., List July, '88.....50¢10¢60¢
 Sargent & Co., List Aug. 1, '88.....55¢2¢
 Reading Hardware Co., List Feb. 2, '88.....10¢60¢10¢
 Livingston & Co.....55¢60¢10¢
 Note.—Lower net prices often made.
 Perkins' Burglar Proof.....60¢25¢
 Plate.....35¢25¢
 F. Many's "Extension Cylinder" \$10.50 7 dos.

Barnes Mfg. Co.....40¢40¢10¢
 Yale Corrugated Key.....35¢
 Delta Flat Key.....35¢
 L. & C. Round Key Latches.....30¢10¢
 L. & C. Flat Key Latches.....35¢10¢
 Romer's Night Latches.....15¢
 Yale, new list.....35¢4¢
 "Shepardson" or "U. S.".....45¢
 "Felter" or "American".....40¢10¢
 Seed's N. Y. Hesp Lock.....25¢

Cabined—
 Eagle, Gaylord Par., List March, '84, rev. ker and Corbin.....Jan. 1, '86, 35¢42¢
 Deltz, Nos. 36 to 39.....40¢
 Deltz, Nos. 51 to 63.....40¢10¢
 Deltz, Nos. 86 to 90.....30¢
 Stoddard Lock Co.....30¢35¢4¢
 "Champion" Night Latches.....40¢
 Barnes Mfg. Co.....40¢40¢10¢
 Eagle and Corbin Trunk.....35¢25¢
 "Champion" Cab. and Combin.....35¢
 Yale.....35¢
 Romer's.....25¢

Padlocks—
 List Dec. 23, '84.....75¢75¢10¢
 Yale Lock Mfg. Co.'s.....35¢4¢
 Eagle.....25¢25¢
 Eureka, Eagle Lock Co.....40¢5¢
 Romer's, Nos. 0 to 91.....30¢
 Romer's Scandinavian, &c., Nos. 100 to 606.....15¢
 A. E. Deltz.....40¢
 "Champion" Padlocks.....40¢
 Hotchkiss.....30¢
 "Star".....45¢
 "Horsehoe," 7 dos, \$9, dis 40¢40¢10¢
 Barnes Mfg. Co.....40¢40¢10¢
 Nock's.....30¢
 Brown's Pat.....25¢
 Scandinavian.....90¢90¢10¢
 Fralm's Pat. Scandinavian low list.....60¢
 Ames Sword Co. up to No. 150.....40¢
 Ames Sword Co. above No. 150.....50¢

Lumber Tools.
 Ring Peavies, "Blue Line".....7 dos \$20.00
 Ring Peavies, Common.....7 dos \$12.00
 Steel Socket Peavies.....7 dos \$21.00
 Mail Iron Socket Peavies.....7 dos \$12.00
 Cant Hooks, "Blue Line".....7 dos \$16.00
 Cant Hooks, Common Finish.....7 dos \$14.00
 Cant Hooks, Mail Socket Clasp, "Blue Line" Finish.....\$16.00
 Cant Hooks, Mail Socket Clasp, Common Finish.....7 dos \$14.50
 Cant Hooks, Clip Clasp, "Blue Line" Finish.....7 dos \$14.00
 Cant Hooks, Clip Clasp, Common Finish.....7 dos \$12.00
 Hand Spikes.....7 dos 5 ft., \$15.00; 8 ft., \$20.00
 Pike Poles, Pike & Hook, 7 dos., 12 ft., \$11.50; 14 ft., \$12.50; 16 ft., \$14.50; 18 ft., \$17.50; 20 ft., \$21.50
 Pike Poles, Pike only, 7 dos, 13 ft., \$10.00; 14 ft., \$11.00; 16 ft., \$13.00; 18 ft., \$16.00; 20 ft., \$20.00
 Pike Poles, not ironed, 7 dos, 12 ft., \$6.00; 14 ft., \$7.00; 16 ft., \$8.00; 18 ft., \$12.00; 20 ft., \$16.00
 Setting Poles, 7 dos, 13 ft., \$14.00; 14 ft., \$15.00; 16 ft., \$17.00
 Swamp Hooks.....7 dos \$18.00

Laustr—
 Four-ounce Bottles.....7 dos, \$1.75; 7 gross.....\$17.00

Mallets—
 Hickory.....20¢10¢20¢10¢10¢
 Lignumvite.....20¢10¢20¢10¢10¢
 B. & L. Block Co., Hickory & L. V.....30¢30¢10¢

Match Safes—
 Dangerfield's Self-Igniting.....7 dos \$1.50.
 Mattocks, Regular List.....60¢5¢60¢10¢

Meat Cutters—
 Dixon's 7 dos:
 Nos. 1 2 3 4
 \$14.00 \$17.00 \$19.00 \$30.00, dis 40¢5¢
 Woodruff's 7 dos:
 Nos.....100 150
 \$15.00 \$18.00.....dis 40¢5¢

Champion 7 dos:
 Nos. 200 300 400
 \$22.00 \$27.00 \$40.00.....dis 40¢45¢
Hales Pattern 7 dos:
 Nos. 11 12 13
 \$27.00 \$33.00 \$45.00, dis 70¢70¢5¢

American.....
 Nos.....1 2 3 4B
 Each.....\$5 \$7 \$10 \$25 \$50 \$90
Enterprise.....
 Nos.....10 12 22 32 45
 Each.....\$3 \$2.50 \$4 \$6 \$15
Pennsylvania.....
 Nos.....1 2 3 00
 7 dos.....\$24.00 \$28.00 \$36.00 \$28.00

Miles Challenge 7 dos:
 Nos. 1 2 3
 \$22.00 \$30.00 \$40.00.....45¢45¢10¢
Home No. 1.....
 7 dos, \$26.00, dis 55¢10¢
Draw Cut, each:
 Nos. 5 2 6 8
 \$60 \$75 \$80 \$225.....20¢25¢
Beef Shavers (Enterprise).....
 20¢10¢30¢
Chadborn's Smoked Beef Cutter.....
 30¢.00

Mincing Knives—
 Am. (2d quality), 7 gr. 1 blade, \$7; 2 blades, \$12; 3 blades, \$18.....net
 Lothrop's.....20¢10¢
 Smith's, 7 dos, Single, \$2.00; Double, \$3 40¢45¢
Knapp & Cowles.....
 50¢10¢50¢
Buffalo Adjustable.....
 7 dos, \$3.00, 25¢

Melasses Gates—

Stebbin's Pat.	70¢ 70¢ 71¢
Stebbin's Genuine	50¢ 10¢ 10¢
Stebbin's Tinned Ends	40¢ 10¢
Chase's Hard Metal	50¢ 10¢
Busch's	30¢
Lincoln's Pattern	70¢ 70¢ 10¢
Weed's	30¢ 10¢

Boss, 7¢ doz.
Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

Money Drawers—

Muscles—
Safety— 7¢ doz, \$3.00 dis 25¢

Nails, see Trade Report.

Wire Nails & Brads, list July 14, '87 70¢ 10¢
Wire Nails, Standard Penny— 70¢ 10¢

Wire Nails, Standard Penny— 70¢ 10¢

Nail Puller—

Curtiss Hammer— 7¢ doz \$9, net
Giant, No. 1— 7¢ doz, \$30.00, 10¢
Pelican— 7¢ doz, \$9.00, dis 25¢
Boss— 7¢ doz, \$30.00, dis 30¢
Lightning— 7¢ doz \$21.00

Nail Sets—

Square— 7¢ gr, \$4.00@4.25
Round— 7¢ gr, \$3.25
Cannon's Diamond Point— 7¢ gr, \$12, 20¢

Nut Crackers—

Table (H. & B. Mfg. Co.)— 40¢
Blake's Pattern— 7¢ doz \$2.00, dis 10¢
Turner & Seymour Mfg. Co.— 50¢

Nuts—

Nuts, off list Jan. 1, 1888: Square. Hex.
Hot Pressed— 5.4¢ 5.9¢
Cold Punched— 5.4¢ 5.9¢
In lots less than 100 lb, add 1/4¢; 1-lb boxes, add 1/2¢ to list.

Oakum—

Government— 7¢ 7¢ 7¢
U. S. Navy— 7¢ 6¢ 7¢
Navy— 7¢ 5¢ 6¢ 7¢

Oilers—

Zinc and Tin— 65¢ 65¢ 10¢
Brass and Copper— 50¢ 10¢ 10¢ 10¢
Malleable, Hammer's Improved, No. 1, \$8.00; No. 2, \$4.00; No. 3, \$2.40 7¢ doz
Malleable, Hammer's, Old Pattern, same list 40¢
Prior's Pat. or "Paragon" Zinc— 60¢ 10¢ 10¢
Prior's Pat. or "Paragon" Brass— 50¢
Olmstead's Tin and Zinc— 60¢
Olmstead's Brass and Copper— 50¢
Broughn's Zinc— 60¢
Broughn's Brass— 50¢

Packing, Steam—

Rubber—
Standard— 60¢ 10¢ 60¢ 10¢ 10¢
Extra— 60¢ 10¢ 60¢
N. Y. B. & P. Co., Standard— 60¢ 10¢ 60¢
N. Y. B. & P. Co., Empire— 70¢
N. Y. B. & P. Co., Salamander— 70¢
Jenkins' Standard— 7¢ 65¢, dis 30¢
Miscellaneous— 7¢ 80¢, dis 30¢

Miscellaneous—

American Packing— 10¢ 11¢ 7¢
Russia Packing— 14¢ 7¢
Italian Packing— 13¢ 14¢ 7¢
Cotton Packing— 15¢ 17¢ 7¢
Jute— 7¢ 8¢ 7¢

Padlocks—**See Locks.****Pails—**

Galvanized Iron—
Quarts— 10 12 14
Hill's Light Weight, 7¢ doz \$2.75 3.00 3.25
Hill's Heavy Weight, 7¢ ds. 3.00 3.25 3.75
Whiting's— 2.75 3.00 3.25
Sidney Shepherd & Co.— 2.80 3.00 3.40
Iron Clad— 2.75 3.00 3.25
Fire Buckets— 2.75 3.25 3.50
Buckets, see Well Buckets.

Indurated Fibre Ware—

Star Pails, 12 qt— 7¢ doz \$4.50
Fire, Stable and Milk, 14 qt— 7¢ doz \$5.85

Pencils—

Faber's Carpenters— high list 50¢
Faber's Round Gilt— 7¢ doz \$5.25 net
Dixon's Lead— 7¢ doz \$4.50 net
Dixon's Lumber— 7¢ doz \$6.75 net
Dixon's Carpenters— 40¢ 10¢

Picks—

Railroad or Adze Eye, 5 to 6, \$12.00; 6 to 7, \$13.00— dis 60¢ 50¢ 60¢ 10¢

Picture Nails—

Brass Head, Sargent's list— 50¢ 10¢ 10¢
Brass Head, Combination list— 50¢ 10¢
Porcelain Head, Sargent's list— 50¢ 10¢ 10¢
Porcelain Head, Combination list— 40¢ 10¢
Niles' Patent— 40¢

Pinking Irons—

7¢ doz 65¢ net

Pipe, Wrought Iron—

List March 23, 1887.
1 1/2 and under, Plain— 55¢
1 1/2 and under, Galvanized— 47 1/2¢
1 1/2 and over, Plain— 65¢
1 1/2 and over, Galvanized— 55¢
Boiler Tubes, Iron— 60¢

Planes and Plane Irons—

Wood Planes—
Molding— 50¢ 50¢ 10¢
Bench, First Quality— 60¢ 60¢ 5¢
Bench, Second Quality— 60¢ 10¢ 60¢ 10¢ 10¢
Bailey's (Stanley R. & L. Co.)— 40¢ 10¢

Iron Planes—

Bailey's (Stanley R. & L. Co.)— 40¢ 10¢
Miscellaneous Planes (Stanley R. & L. Co.)— 20¢ 10¢
Victor Planes (Stanley R. & L. Co.)— 20¢ 10¢
Steer's Iron Planes— 35¢ 35¢ 5¢
Meriden Mill Iron Co.'s— 30¢ 10¢ 30¢ 10¢ 10¢
Davis's Iron Planes— 30¢ 10¢ 30¢ 10¢ 10¢
Birmingham Plane Co.— 50¢ 50¢ 5¢
Gage Tool Co.'s Self-Setting— 30¢ 10¢
Chapin's Iron Planes— 40¢ 40¢ 5¢
Sargent's— 30¢ 10¢ 30¢ 10¢ 10¢

Plane Irons—

Plane Irons— 30¢ 10¢
Plane Irons, Busch's— \$5.00@5.25 to 5.50
Plane Irons, Rock Bros— 30¢
Plane Irons, Auburn Tool Co., "This side"— 40¢
Sandusky Tool Co.:
Single and Cut— 30¢
Double— 40¢
L. & J. White— 35¢

Pliers and Nippers—

Button's Patent— 30¢ 10¢ 40¢
Hally's No. 2, 5 in., \$18.50; No. 4, 7 in., \$21.00 7¢ doz— 30¢ 10¢ 30¢
Humason & Beckley Mfg. Co.— 50¢ 40¢ 10¢
Gas Pliers— 60¢
Gas Pliers, Custer's Nickel Plated— 60¢ 5¢
Eureka Pliers and Nippers— 40¢
Russell's Parallel— 25¢
P. S. & W. Cast Steel— 50¢
P. S. & W. Tinnars' Cutting Nippers— 50¢
Carew's Pat. Wire Cutters— 30¢
Morrill's Parallel, 7¢ doz, \$12.00— 30¢ 5¢
Cronk's 8 in., \$15.00; 10 in., \$21.00— 40¢ 40¢ 5¢

Plumbs and Levels—

Regular List— 70¢ 10¢ 70¢ 10¢ 10¢
Disston's— 45¢ 10¢
Pocket Levels— 70¢ 10¢ 70¢ 10¢ 10¢
Davis Iron Levels— 30¢
Davis' Inclination Levels— 10¢ 10¢

Peppers, Corn—

Round or Square, 1 qt.— 7¢ gr \$12.00@15.00
Round or Square, 2 qt.— 7¢ gr \$25.00@30.00

Post Hole and Tree Augers and Diggers—

Samson Post Hole Digger, 7¢ doz \$36.00, dis 25¢ 10¢
Fletcher Post Hole Augers, 7¢ doz \$38.00, dis 20¢
Eureka Diggers— 7¢ doz \$16.00@17.00
Lead's— 7¢ doz \$8.00@9.00
Vaughan's Post Hole Auger— 7¢ doz \$13.00@14.00
Kohler's Little Giant— 7¢ doz \$18.00
Kohler's Hercules— 7¢ doz \$15.00
Kohler's New Champion— 7¢ doz \$9.00
Schneider— 7¢ doz \$18.00
Ryan's Post Hole Diggers— 7¢ doz \$24.00
Cronk's Post Holes— 7¢ doz \$30.00
Gibb's Post Hole Digger, 7¢ doz \$30.00, dis 40¢ 40¢ 10¢

Potato Parers—

White Mountain— 7¢ doz \$6.00@6.50
Antrim Combination— 7¢ doz \$8.00
Hoover— 7¢ doz \$15.50

Pruning Hooks and Shears—

Disston's Combined Pruning Hook and Saw— 7¢ doz \$18.00, dis 30¢ 10¢
Disston's Pruning Hook, 7¢ doz \$12.00, dis 20¢ 10¢
E. S. Lee & Co.'s Pruning Tools— 40¢
Pruning Shears, Henry's Pat.— 7¢ doz \$3.75@4.00 net
Henry's Pruning Shears, 7¢ doz \$4.25, 4.50 net
Wheeler, Co.'s Combination— 7¢ doz \$12.00, dis 20¢
Dunlap's Saw and Chisel, 7¢ doz \$5.50, dis 30¢
J. Mallinson & Co., No. 1, \$5.25; No. 2, 7.25

Pulleys—

Hot House, Awning, &c.— 60¢ 10¢
Japanned Screw— 60¢ 10¢
Brass Screw— 60¢ 10¢
Japanned Slide— 60¢ 10¢
Japanned Clothes Line— 60¢ 10¢
Example Sash Pulley— 50¢ 60¢
Moore's Sash, Anti-Friction— 50¢
Hay Fork, Solid Eye, \$4.00; Swivel— \$4.50
Hay Fork, "Anti-Friction," 5 in. Solid— \$5.70
Hay Fork, "F" Common and Pat.— 20¢
Hay Fork, Tarbox Pat. Iron— 20¢
Hay Fork, Reed's Self-Lubricating— 60¢
Shade Rack— 45¢
Tackle Blocks— See Blocks

Pumps—

Clatren, Best Makers— 50¢ 10¢ 60¢
Pitcher Spout, Best Makers— 60¢ 10¢ 60¢
Pitcher Spout, Cheaper Goods— 70¢ 10¢ 60¢
Pitches—
Saddlers' or Drive, good quality, 7¢ doz 60¢ 65¢
Bemis & Call Co.'s Cast Steel Drive— 50¢ 5¢
Bemis & Call Co.'s Springfield Socket— 60¢ 5¢
Spring, good quality— 7¢ doz \$2.50@2.60
Spring, Lead's Pat.— 15¢
Bemis & Call Co.'s Spring and Check— 15¢
Solid Tinnars'— 7¢ doz \$1.44, dis 55¢
Tinnars' Hollow Pitches— 20¢ 25¢
Rice Hand Pitches— 15¢
Avery's Revolving— 30¢ 10¢
Avery's Saw-Set and Punch. See Saw Sets.

Rail—

Sliding Door, Wrt Brass, 7¢ 35¢, dis 15¢
Sliding Door, Bronzed Wrt Iron, 7¢ ft. 7¢
Sliding Door, Iron, Painted— 7¢ foot 4¢
Barn Door, Light In. 1/4— 5¢ 1/4
Per 100 feet— \$2.50 3.00 4.40, dis 10¢
B. D. for N. E. Hangers— Small. Med. Large.
Per 100 feet— \$2.15 2.70 3.25, net
Terry's Wrought Iron, 7¢ foot— 4¢ 5¢
Victor Track Rail, 7¢ foot— dis 50¢ 2¢
Carrier Steel Rail, 7¢ foot— 4¢ 5¢

Rakes—

Cast Steel, Association goods— 65¢
Cast Steel, outside goods— 60¢ 10¢ 70¢
Malleable— 70¢ 70¢ 5¢
Gibbs Lawn Rake— \$12.00, dis 50¢
Canton Lawn Rake— \$9.00, dis 50¢
Ft. Madison Prize Bow Rake and Peerless— 65¢
Fort Madison Steel Tooth Lawn Rake— \$8.00, dis 25¢

Razors—

J. R. Torrey Razor Co.— 20¢
Wootenholme and Butcher, \$10.00 to 15¢

Razor Straps—

Genuine Emery— 60¢ 60¢ 25¢
Imitation— 7¢ doz \$3.00, dis 20¢ 10¢ 25¢
Turkey— 30¢
Sargent's Belt and Com— 7¢ doz \$2.00
Lamont Combination— 7¢ doz \$4.00

Rivets and Bars—

Copper— 50¢
Iron, list Nov. 17, '87— 50¢

Rivet Sets—

dis 50¢ 20¢ 50¢ 10¢

Reeds—

Stair, Brass— 35¢ 25¢
Stair, Black Walnut— 7¢ doz 40¢

Rollers—

Barn Door, Sargent's list— 60¢ 10¢ 10¢
Aome (Anti-Friction)— 55¢
Union Barn Door Roller— 70¢

Rope—

Manufacturers' prices for large lots:
Manila— 1/4 in. and larger 7¢ 15¢
Manila— 1/4 in. 7¢ 15¢
Manila— 1/2 and 5-16 in. 7¢ 15¢
Manila Tarred Rope— 7¢ 15¢
Manila Hay Rope— 7¢ 15¢
Sisal— 1/4 inch and larger 7¢ 15¢
Sisal— 1/2 and 5-16 in. 7¢ 15¢
Sisal Hay Rope— 7¢ 15¢
Sisal

Machines—		
Viat Head, Iron.....	54	
Round Head, Iron.....	56	
Bench and Hand—		
Bench, Iron.....	55	10@55
Bench, Wood, Beech.....	55	10@55
Bench, Wood, Hickory.....	55	10@55
Hand, Wood.....	55	10@55
Lag, Blunt Point.....	75	10@75
Coch and Lag, Gimlet Point.....	75	10@75
Bed.....	55	10@55
Hand Rail, Sargent's.....	70	10@70
Hand Rail, H. & B. Mfg. Co.....	70	10@70
Hand Rail, Am. Screw Co.....	70	10@70
Jack Screws, Millers Falls list.....	50	10@50
Jack Screws, P. S. & W.....	50	10@50
Jack Screws, Sargent.....	50	10@50
Jack Screws, Stearns.....	40	10@40
Scroll Saws—		
Lester, complete, \$10.00.....	25	
Rogers, complete, \$4.00.....	25	
Barnes' Builders' and Cabinet Makers'.....	15	
Barnes' Scroll Saw Blades.....	35	
Scythe Smaths—		
Shears.....	50	25
American (Cast) Iron—		
Pruning.....	75	10@75
See Pruning Hooks and Shears.....		
Barnard's Lamp Trimmers.....	50	10@50
Timmers.....	50	10@50
Seymour's, List, Dec. 1881.....	60	10@60
Heinrich's, List, Dec. 1881.....	60	10@60
Heinrich's Tailor's Shears.....	35	10@35
First quality C. S. Trimmers.....	80	10@80
Second quality C. S. Trimmers.....	80	10@80
Acme Cast Shears—		
Diamond Cast Shears.....	10	10@10
Clippers.....	10	10@10
Victor Cast Shears.....	75	10@75
Howe Bros. & Hulbert, Solid Forged.....	10	10@10
Chicago Drop Forge & F. Co., Solid.....	10	10@10
Steel Forged.....	70	
Clausen Shear Co., Japanned.....	70	
Clausen Shear Co., Nickeled, same list.....	60	
Sheaves—		
Sliding Door—		
M. W. Co., List July, 1888.....	50	10@50
R. & E., List Dec. 18, 1888.....	50	10@50
Cornish's list.....	60	10@60
Patent Roller.....	60	10@60
Patent Roller, Hatfield's.....	75	
Russell's Anti-Friction, List Dec. 18, 1888.....	60	10@60
Moore's Anti-Friction.....	60	10@60
Sliding Shutter—		
R. & E. List Dec. 18, 1888.....	60	10@60
Sargent's list.....	60	10@60
Reading list.....	60	10@60
Ship Tools—		
L. & J. White.....	20	10@20
Albertson Mfg. Co.....	25	
Sheep, Horse, Mule, &c.—		
Horse—		
Burden's, Perkins', Phoenix, at factory.....		\$4.00
Mule—		
Add 1¢ per keg to above prices.....		
Oil, Wrought—		
Ton lots.....	100	10@100
500 b. lots.....	100	10@100
500 b. lots.....	100	10@100
Shot—		
(Eastern prices 2¢ off, cash, 5 days.)		
Drop, 7 bag, 25 b.....	1.20	
Drop, 7 bag, 5 b.....	1.20	
Buck and Chilled, 7 25-b bag.....	1.45	
Buck and Chilled, 7 5-b bag.....	.34	
Shovels and Spades—		
Ames' Shovels, Spades, &c., list Nov. 1, 1888.....	30	
Norman's Shovels, frequently give 7¢ off.....	30	
Griffith's Black Iron.....	50	10@50
Griffith's C. S.....	60	10@60
Griffith's Solid C. S. R. Goods.....	30	
Old Colony (Santford Fork & Tool Co.).....	30	
St. Louis Shovel Co.....	30	
Hussey, Binns & Co.....	15	10@15
Hubbard & Co.....	20	10@20
Lehigh Mfg. Co.....	50	10@50
Payne Pettibone & Son, list January, 1888.....	30	
Remington's (Lowman's Patent).....	30	10@30
Rowland's, Black Iron.....	40	10@40
Rowland's Steel.....	60	10@60
Sheaves and Tongs—		
Iron Head.....	60	10@60
Brass Head.....	60	10@60
Skells, Thimble—		
Western list.....	75	10@75
Columbus Wrt. Steel, list Nov. 1, 1887.....	30	
Coldbrookdale Iron Co.....	60	10@60
Utica P. S. T. Skells.....	60	
Utica Turned and Fitted.....	60	
Sieves—		
Buffalo Metallic, S. S. & Co.....	50	10@50
Barber Flour Sifters.....	50	10@50
Smith's Adjustable Sifters.....	50	10@50
Smith's Adjustable Milk Strainer.....	50	10@50
Smith's Adjustable F. & C. Strainer.....	50	10@50
Sieves, Wooden Rim—		
Mesh 15, Nested, 70¢.....	70	
Mesh 30, Nested, 70¢.....	70	
Mesh 24, Nested, 70¢.....	70	
Slates—		
School, by case.....	50	10@50
Snaps, Harness, &c.—		
Anchor (T. & S. Mfg. Co.).....	65	
Fitch's (Bristol).....	50	10@50
Hotchkiss.....	10	
Andrews.....	50	
Sargent's Patent Guarded.....	70	10@70
German, new list.....	40	10@40
Covert.....	50	10@50
Covert, New Patent.....	50	10@50
Covert, New E. E.....	50	10@50
Covered Spring.....	60	10@60
Soldering Irons—		
Covert's Adjustable, list Jan. 1, 1888.....	55	10@55
Spoke Shaves—		
Iron.....	45	
Wood.....	30	
Bailey's (Stanley R. & L. Co.).....	40	10@40
Stearns.....	30	10@30
Spoke Trimmers—		
Bonney's.....	50	10@50
Stearns.....	50	10@50
Ives, No. 1, \$15.00; No. 2, \$12.00.....	50	10@50
Douglas.....	50	10@50
Speens and Forks—		
Tinned Iron—		
Basting, Cen. Stamp. Co.'s list.....	70	10@70
Solid Table and Tea, Cen. Stamp. Co.'s list.....	70	10@70
Buffalo S. S. & Co.....	35	10@35
Silver-Plated (4 mos. or 5¢ cash 30 days).....	35	10@35
Meriden Brit. Co., Rogers.....	50	10@50
C. Rogers & Bros.....	50	10@50
Rogers & Bros.....	50	10@50
Reed & Barton.....	50	10@50
Wm. Rogers Mfg. Co.....	50	10@50
Simpson, Hall, Miller & Co.....	50	10@50
Holmes & Edwards Silver Co.....	50	10@50
H. & E. Silver Co., Mexican Silver.....	50	10@50
H. & E. Silver Co., Durham Silver.....	50	10@50
German Silver.....	50	10@50
German Silver, Hall & Elton.....	50	10@50
Nickel Silver.....	50	10@50
Britannia.....	60	
Boardman's Flat Ware.....	50	10@50
Boardman's Nickel Silver.....	50	10@50
Boardman's Britannia Spoons, case.....	60	
Springs—		
Elliptic, Concord, Platform and Half.....	60	10@60
Cliff's Bolster Springs.....	25	
Squares—		
Steel and Iron.....	75	10@75
Nickel-Plated.....	75	10@75
Try Square and T Bevels.....	80	10@80
Dixson's Try Square and T Bevels.....	80	10@80
Winterbottom's Try and Miter.....	30	10@30
Starrett's Micrometer Calliper Squares.....	25	
Avery's Flush Bevel Squares.....	30	10@30
Staples—		
Fence Staples, Galvanized.....	Same price	
Fence Staples, Plain.....	See Trl. Rep.	
Steelyards—		
40 lb.....	40	10@40
Steels and Dies—		
Blacksmith's Waterford Goods.....	30	
Blacksmith's Butterfield's Goods.....	30	
Lightning Screw Plate.....	50	10@50
Reece's New Screw Plates.....	35	10@35
Stones—		
Hindustan No. 1, 3¢; Axe, 3¢; Slips.....		
No. 1, 4¢.....		
Sand Stone.....	10	10@10
Washita Stone, Extra.....	10	10@10
Washita Stone, No. 1.....	10	10@10
Washita Stone, No. 2.....	10	10@10
Washita Stone, No. 3.....	10	10@10
Washita Stone, No. 4.....	10	10@10
Washita Stone, No. 5.....	10	10@10
Washita Stone, No. 6.....	10	10@10
Washita Stone, No. 7.....	10	10@10
Washita Stone, No. 8.....	10	10@10
Washita Stone, No. 9.....	10	10@10
Washita Stone, No. 10.....	10	10@10
Washita Stone, No. 11.....	10	10@10
Washita Stone, No. 12.....	10	10@10
Washita Stone, No. 13.....	10	10@10
Washita Stone, No. 14.....	10	10@10
Washita Stone, No. 15.....	10	10@10
Washita Stone, No. 16.....	10	10@10
Washita Stone, No. 17.....	10	10@10
Washita Stone, No. 18.....	10	10@10
Washita Stone, No. 19.....	10	10@10
Washita Stone, No. 20.....	10	10@10
Washita Stone, No. 21.....	10	10@10
Washita Stone, No. 22.....	10	10@10
Washita Stone, No. 23.....	10	10@10
Washita Stone, No. 24.....	10	10@10
Washita Stone, No. 25.....	10	10@10
Washita Stone, No. 26.....	10	10@10
Washita Stone, No. 27.....	10	10@10
Washita Stone, No. 28.....	10	10@10
Washita Stone, No. 29.....	10	10@10
Washita Stone, No. 30.....	10	10@10
Washita Stone, No. 31.....	10	10@10
Washita Stone, No. 32.....	10	10@10
Washita Stone, No. 33.....	10	10@10
Washita Stone, No. 34.....	10	10@10
Washita Stone, No. 35.....	10	10@10
Washita Stone, No. 36.....	10	10@10
Washita Stone, No. 37.....	10	10@10
Washita Stone, No. 38.....	10	10@10
Washita Stone, No. 39.....	10	10@10
Washita Stone, No. 40.....	10	10@10
Washita Stone, No. 41.....	10	10@10
Washita Stone, No. 42.....	10	10@10
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Washita Stone, No. 44.....	10	10@10
Washita Stone, No. 45.....	10	10@10
Washita Stone, No. 46.....	10	10@10
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Washita Stone, No. 49.....	10	10@10
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Washita Stone, No. 53.....	10	10@10
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Washita Stone, No. 56.....	10	10@10
Washita Stone, No. 57.....	10	10@10
Washita Stone, No. 58.....	10	10@10
Washita Stone, No. 59.....	10	10@10
Washita Stone, No. 60.....	10	10@10
Washita Stone, No. 61.....	10	10@10
Washita Stone, No. 62.....	10	10@10
Washita Stone, No. 63.....	10	10@10
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Washita Stone, No. 72.....	10	10@10
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Washita Stone, No. 82.....	10	10@10
Washita Stone, No. 83.....	10	10@10
Washita Stone, No. 84.....	10	10@10
Washita Stone, No. 85.....	10	10@10
Washita Stone, No. 86.....	10	10@10
Washita Stone, No. 87.....	10	10@10
Washita Stone, No. 88.....	10	10@10
Washita Stone, No. 89.....	10	10@10
Washita Stone, No. 90.....	10	10@10
Washita Stone, No. 91.....	10	10@10
Washita Stone, No. 92.....	10	10@10
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Washita Stone, No. 94.....	10	10@10
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Washita Stone, No. 99.....	10	10@10
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Washita Stone, No. 102.....	10	10@10
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Washita Stone, No. 110.....	10	10@10
Washita Stone, No. 111.....	10	10@10
Washita Stone, No. 112.....	10	10@10
Washita Stone, No. 113.....	10	10@10
Washita Stone, No. 114.....	10	10@10
Washita Stone, No. 115.....	10	10@10
Washita Stone, No. 116.....	10	10@10
Washita Stone, No. 117.....	10	10@10
Washita Stone, No. 118.....	10	10@10
Washita Stone, No. 119.....	10	10@10
Washita Stone, No. 120.....	10	10@10
Washita Stone, No. 121.....	10	10@10
Washita Stone, No. 122.....	10	10@10
Washita Stone, No. 123.....	10	10@10
Washita Stone, No. 124.....	10	10@10
Washita Stone, No. 125.....	10	10@10
Washita Stone, No. 126.....	10	10@10
Washita Stone, No. 127.....	10	10@10
Washita Stone, No. 128.....	10	10@10
Washita Stone, No. 129.....	10	10@10
Washita Stone, No. 130.....	10	10@10
Washita Stone, No. 131.....	10	10@10
Washita Stone, No. 132.....	10	10@10
Washita Stone, No. 133.....	10	10@10
Washita Stone, No. 134.....	10	10@10
Washita Stone, No. 135.....	10	10@10
Washita Stone, No. 136.....	10	10@10
Washita Stone, No. 137.....	10	10@10
Washita Stone, No. 138.....	10	10@10
Washita Stone, No. 139.....	10	10@10
Washita Stone, No. 140.....	10	10@10
Washita Stone, No. 141.....	10	10@10
Washita Stone, No. 142.....	10	10@10
Washita Stone, No. 143.....	10	10@10
Washita Stone, No. 144.....	10	10@10
Washita Stone, No. 145.....	10	1

CURRENT METAL PRICES.

FEBRUARY 13, 1889.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market reports.

IRON AND STEEL.	
Bar Iron from Store.	
Common Iron:	
3/4 to 2 in. round and square...	\$ 1.90 @
1 to 6 in. x 3/4 to 1 in.	\$ 2.00 @
Refined Iron:	
3/4 to 2 in. round and square...	\$ 2.00 @ 2.10
1 to 4 in. x 3/4 to 1 1/4 in.	\$ 2.10 @ 2.30
4 1/2 to 6 in. x 3/4 to 1 in.	\$ 2.20 @ 2.30
1 to 6 in. x 1 1/4 and 5-16	\$ 2.30 @ 2.50
Rods—3/4 and 1-1/2 round and sq.	\$ 2.20 @ 2.30
Bands—1 to 6 x 3-16 to No. 12	\$ 2.20 @ 2.30
"Burden Best" Iron, base price	\$ 2.00 @
Burden's "H. B. & S." Iron, base price	\$ 2.80 @
"Ulster"	\$ 2.10 @
Norway Rods	\$ 4.00 @ 5.00
Merchant Steel from Store.	
Open-Hearth and Bessemer Machinery, Toe Calk, Tire and Sleigh Shoe, base price in small lots	\$ 2.40
Best Cast Steel, base price in small lots	\$ 2.50
Best Cast Steel Machinery, base price in small lots	\$ 4

Sheet Iron from Store.	
Common American.	
10 to 16	\$ 2.75 @ 2.80
17 to 20	\$ 2.85 @ 3.00
21 to 24	\$ 3.00 @ 3.10
25 and 26	\$ 3.20 @ 3.50
27	\$ 3.35 @ 3.75
28	\$ 3.50 @ 4.00
R. G. Cleaned.	
Galv'd, 14 to 20	\$ 4.50 @ 4.85
Galv'd, 1 to 24	\$ 4.75 @ 4.85
Galv'd, 25 to 30	\$ 5.12 @ 5.15
Galv'd, 31 to 36	\$ 5.48 @ 5.55
Galv'd, 37	\$ 5.85 @
Galv'd, 38	\$ 6.00 @
Patent Planished.	
Russia	\$ 9 1/4 @ 10 1/4
American Cold Rolled B. B.	\$ 5 1/4 @ 7 1/4
English Steel from Store.	
Best Cast	\$ 15 @
Extra Cast	\$ 17 @
Swaged, Cast	\$ 16 @
Best Double Shear	\$ 15 @
Master, 1st quality	\$ 13 1/4 @
German Steel, Best	\$ 10 @
3d quality	\$ 9 @
2d quality	\$ 8 @
Sheet Cast Steel, 1st quality	\$ 15 @
2d quality	\$ 14 @
3d quality	\$ 12 1/4 @

METALS.	
Tin.	
Banca, Piss	\$ 22 1/4 @
Strait, Piss	\$ 22 1/4 @
Malacca, Piss	\$ 22 1/4 @
Quina in Bars	\$ 24 1/4 @
Tin Plates.	
Charcoal Plates.—Bright.	
Melny Grade	\$ 5.75 @ \$6.00
IC, 10 x 14	\$ 5.75 @ 6.25
IC, 12 x 12	\$ 5.75 @ 6.00
IC, 14 x 20	\$ 5.75 @ 6.00
IC, 20 x 26	\$ 5.75 @ 6.00
IC, 10 x 14	\$ 7.25 @ 7.50
IC, 12 x 12	\$ 7.25 @ 7.50
IC, 14 x 20	\$ 7.25 @ 7.50
IC, 20 x 26	\$ 7.25 @ 7.50
DC, 12 1/2 x 17	\$ 5.00 @ 5.75
DX, 12 1/2 x 17	\$ 7.00 @ 7.25
Oiled and Grade.	
IC, 10 x 14	\$ 5.75 @ 6.00
IC, 12 x 12	\$ 5.75 @ 6.00
IC, 14 x 20	\$ 5.75 @ 6.00
IC, 20 x 26	\$ 5.75 @ 6.00
IC, 10 x 14	\$ 7.25 @ 7.50
IC, 12 x 12	\$ 7.25 @ 7.50
IC, 14 x 20	\$ 7.25 @ 7.50
IC, 20 x 26	\$ 7.25 @ 7.50
DC, 12 1/2 x 17	\$ 5.00 @ 5.75
DX, 12 1/2 x 17	\$ 7.00 @ 7.25
Allaway Grade.	
IC, 10 x 14	\$ 5.00 @ 5.12 1/2
IC, 12 x 12	\$ 5.00 @ 5.12 1/2
IC, 14 x 20	\$ 5.00 @ 5.12 1/2
IC, 20 x 26	\$ 5.00 @ 5.12 1/2
IC, 10 x 14	\$ 6.00 @ 6.25
IC, 12 x 12	\$ 6.00 @ 6.25
IC, 14 x 20	\$ 6.00 @ 6.25
IC, 20 x 26	\$ 6.00 @ 6.25
DC, 12 1/2 x 17	\$ 4.75 @ 5.00
DX, 12 1/2 x 17	\$ 5.75 @ 6.00
Coke Plates.—Bright.	
Steel Coke.—IC, 10 x 14, 14 x 20	\$ 4.75 @ \$5.00
10 x 30	\$ 7.25 @ 7.50
20 x 26	\$ 9.75 @ 10.25
IX, 10 x 14, 14 x 20	\$ 5.50 @ 5.75
BY Grade.—IC, 10 x 14, 14 x 20	\$ 4.40 @ 4.60
Charcoal Plates.—Terns.	
Dean, Grade.—IC, 14 x 20	\$ 4.40 @ \$4.62 1/2
20 x 26	\$ 9.00 @ 9.25
IX, 14 x 20	\$ 4.40 @ 4.62 1/2
20 x 26	\$ 11.00 @ 11.27 1/2
Abocarse Grade.—IC, 14 x 20	
20 x 26	\$ 4.50 @ 4.75
IX, 14 x 20	\$ 5.00 @ 5.25
20 x 26	\$ 10.50 @ 10.80
Tin Boiler Plates.	
IX, 14 x 20	112 sheets @ \$12.50 @ \$12.75
IX, 14 x 26	112 sheets @ 12.75 @
IX, 14 x 31	112 sheets @ 14.25 @

Copper.	
Duty: Pig. Bar and Ingot, 4¢; Old Copper, 3¢ 1/2 lb. Manufactured (including all articles of which Copper is a component of chief value), 4¢ ad valorem.	
Ingot.	
Lake	@ 17 @ 17 1/4
"Anchor" Brand	@ 16 1/4 @ 17 @

Sheet and Bolt.	
Prices adopted by the Association of Copper Manufacturers of the United States, December 10, 1887, being quotations for all sized lots.	
Not wider than	Not longer than
Not longer than	And longer than
Over 64 oz.	Over 64 oz.
32 to 64 oz.	16 to 32 oz.
16 to 32 oz.	14 to 16 oz.
12 to 14 oz.	10 to 12 oz.
8 to 10 oz.	Less than 8 oz.
30-72	25 25 25 26 27 28 31 33
30-72	25 25 25 26 27 28 30 34
30-72	25 25 25 26 27 28 33 36
30-72	25 25 25 26 27 28 30 34
30-72	25 25 25 26 27 28 31 35
30-72	25 25 25 26 27 28 32 36
30-72	25 25 25 26 27 28 31 35
30-72	25 27 28
30-72	27 28
Over 64 in. wide	28 30

All Bath Tub Sheets..... 16 oz. 14 oz. 12 oz. 10 oz.	
Per pound..... \$0.43 0.30 0.32 0.35	
Bolt Copper, 3/4 inch diameter and over, per pound..... 35¢	
Circles, 60 inches in diameter and less, 3 cents per pound advance over lowest prices of Sheet Copper of the same thickness.	
Circles, over 60 inches diameter, up to 96 inches diameter inclusive, 5 cents per pound advance over lowest prices of Sheet Copper of the same thickness.	
Circles, over 96 inches diameter, 6 cents per pound advance over lowest prices of Sheet Copper of the same thickness.	
Segment and Pattern Sheets, 3 cents per pound advance over price of sheets required to cut them from.	
Cold or Hard Rolled Copper, 14 ounces per square foot and heavier, 1 cent per pound over the foregoing prices.	
Cold or Hard Rolled Copper, lighter than 14 ounces per square foot, 3 cents per pound over the foregoing prices.	

Copper Bottoms, Pits and Flats.	
14 ounce to square foot and heavier.....	28¢
12 ounce and up to 14 ounce to square foot.....	29¢
10 ounce and up to 12 ounce.....	31¢
Circles less than 8 inches diameter 3 cents per pound additional.	
Circles over 13 inches diameter are not classed as Copper Bottoms.	

Tinning.	
Tinning sheets on one side, 10, 12 and 14 x 48 each.....	8¢
Tinning sheets on one side, 20 x 60 each.....	30¢
For tinning boiler sizes, 9 in. (sheets 14 in. x 60 in.), each.....	15¢
For tinning boiler sizes, 8 in. (sheets 14 in. x 56 in.), each.....	12¢
For tinning boiler sizes, 7 in. (sheets 14 in. x 52 in.), each.....	10¢
Tinning sheets on one side, other sizes, per square foot.....	2¢
For tinning both sides double the above prices.	
Planished Copper.	
Planished Copper List May 5, 1888.....	Net

Brass and Copper Tubes.	
Seamless Copper.	
3/4 inch \$ lb.	50¢
1 inch " "	44¢
1 1/4 " "	42¢
2 " "	40¢
2 1/2 " "	38¢
3 " "	37¢
3 1/2 " "	36¢
4 " "	34¢
4 1/2 " "	34¢
Seamless Brass.	
3/4 inch \$ lb.	47¢
1 inch " "	41¢
1 1/4 " "	39¢
2 " "	37¢
2 1/2 " "	36¢
3 " "	34¢
3 1/2 " "	34¢
4 " "	31¢
4 1/2 " "	31¢

Roll and Sheet Brass.	
Discount from list.....	10 @ 15 %
Spelter.	
Duty: Pig. Bars and Plates, \$1.50 @ 100 lb.	
Western Spelter	5 1/4 @ 6 @
"Bergenport"	5 1/4 @ 6 @
"Bertha"	7 1/4 @ 8 @

Zinc.	
Duty: Sheet, 2 1/4 @ \$ lb.	
600 lb casks	6 1/4 @
Per lb	7 1/4 @
Lead.	
Duty: Pig, 3¢ @ 100 lb. Old Lead, 2¢ @ \$ lb. Pipe and Sheets, 3¢ @ \$ lb.	
American	4 1/4 @
Newark	4 1/4 @
Bar	5 1/4 @
Pipe, subject to trade discount.....	6 1/4 @
Tin-Lined Pipe, subject to trade discount.....	15¢
Block Tin Pipes, subject to trade discount.....	45¢
Sheet, subject to trade discount.....	7 1/4 @

Solder.	
1/2 @ 1/4 (Guaranteed).....	16¢
Extra Wiping	18 1/4 @
The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.	
Antimony.	
Cookson	\$ lb 13 1/4 @ 14 @
Hallett's	12 @ 12 1/4 @

Plumbers' Brass Work.	
Discount per cent.	
Ground Bibbs and Stops.....	55¢ 10¢
Ground Stops, Hydrant Cocks, &c.....	55¢ 10¢
Corporation Cocks.....	55¢ 10¢

Corporation Cocks, "Mueller" Pattern, from Western List.	
Ground Basin and Shampooing Cocks.....	55¢ 10¢
Compression Basin Cocks.....	55¢ 10¢
Compression Basin and Sink Cocks.....	55¢ 10¢
Compression Pantry Cocks.....	55¢ 10¢
Compression Double Basin and Shampooing Cocks.....	55¢ 10¢
Compression Double Bath Cocks.....	55¢ 10¢
Compression Bibbs, Urinal Cocks, Sill Cocks, Stops, Hopper Cocks, Hydrant Cocks and Ball Cocks.....	55¢ 10¢
Basin Plugs and Basin Grates.....	55¢ 10¢
Bath and Wash Tray Flugs.....	55¢ 10¢
Bath Wastes and Washers, Bath and Basin Valves, Sewer and Vacuum Valves, Cistern Valves, Pump Valves and Strainers, Ship Closet Valves and Suction Baskets.....	55¢ 10¢
Basin Clamps, Basin Joints and Strainers.....	55¢ 10¢
Boiler Couplings, Ground Face, per set \$1.25.....	dis 10
Boiler Couplings, Plain Face, per set \$1.20.....	dis 10
Water Back Valve and Plain Couplings, Soldering Nipples and Unions.....	55¢ 10¢
Union Joints.....	60¢ 10¢
Hydrant Nozzles, Handles and Guides, Sockets and Clamps, Street Washer Screws and Guides.....	55¢ 10¢
Hose Goods	55¢ 10¢

Steam and Gas Fitters' Brass and Iron Work.

Discount per cent.	
Brass Globe Valves.....	60¢ 10¢
Finished Brass Globe Valves, with Finished Brass Wheels.....	40¢ 10¢
Brass Globe Valves, with Patent Wood Wheels.....	60¢ 10¢
Brass Globe Angle and Corner Valves.....	60¢ 10¢
Brass Radiator Angle Valves.....	60¢ 10¢
Brass Radiator Angle Valves, Frink's Patent.....	60¢ 10¢
Brass Cross and Check Valves.....	60¢ 10¢
Brass Check Valves.....	60¢ 10¢
Brass Hose Valves.....	60¢ 10¢
Brass and Iron Frink Valves.....	60¢ 10¢
Brass Safety Valves.....	60¢ 10¢
Brass Vacuum Valves.....	60¢ 10¢
Brass Whistle Valves.....	60¢ 10¢
Brass Balance, Back Pressure and Foot Valves.....	60¢ 10¢
Brass Butterfly and Throttle Valves.....	60¢ 10¢
Brass Pump Valves.....	60¢ 10¢
Brass Steam Cocks.....	57 1/2 @ 10¢
Brass Service, Meter and Union Meter Cocks.....	57 1/2 @ 10¢
Brass Whistles, Water Gauges and Oil Cups.....	60¢ 10¢
Brass Hollow Plug, Tallow and Globe Oil Cups.....	60¢ 10¢
Brass Lubricators.....	60¢ 10¢
Brass Air Valves.....	60¢ 10¢
Brass Air Cocks.....	60¢ 10¢
Brass Gauge Cocks.....	60¢ 10¢
Brass Cylinder Cocks and Steam Bibbs.....	60¢ 10¢
Brass Swing Joints and Expansion Joints.....	60¢ 10¢
Brass Test Pumps.....	60¢ 10¢
Brass Steam Fittings, Rough.....	60¢ 10¢
Brass Steam Fittings, Finished.....	60¢ 10¢
Brass Union Joints.....	60¢ 10¢
Brass Soldering Unions and Nipples.....	55¢ 10¢
Brass Hose Fittings, Fumble and Boiler Plugs.....	55¢ 10¢
Iron Body Globe, Angle, Cross and Check Valves.....	60¢ 10¢
Iron Body Safety, Throttle, Back Pressure, Butterfly and Foot Valves.....	60¢ 10¢
Iron Cocks, all Iron.....	60¢ 10¢
All Iron Valves.....	60¢ 10¢

Miscellaneous.

Discount per cent.	
Cast Iron Fittings.....	70¢ 10
Plugs and Bushings.....	75¢ 10
Malleable Iron Unions.....	67 1/2 @
Malleable Iron Fittings.....	67 1/2 @

Paints.

Black, Lamp—Coach Painters'.....	\$ lb 23 @ 24 @
Ordinary.....	6¢
Black, Ivory Drop, fair.....	12 @ 15¢
best.....	20¢
Black Paint, in oil.....	kegs, 8¢; assorted cans, 11¢
Blue, Prussian, fair to best.....	40 @ 55¢
in oil.....	45 @ 55¢
"Chinese dry.....	70¢
Ultramarine.....	18 @ 30¢
Brown, Spanish.....	14¢
Van Dyke.....	10 @ 12¢
Dryers, Patent American, ass'd cans, 9¢; kegs, 7¢	
Green, Chrome.....	15 @ 20¢
Green, Chrome in oil.....	14 @ 18 @ 20¢
Green, Paris.....	good, 20¢; best, 25¢
Green, Paris in oil.....	good, 30¢; best, 35¢
Iron Paint, Bright Red.....	\$ lb 24 @
Iron Paint, Brown.....	\$ lb 12 @
Iron Paint, Purple.....	\$ lb 3¢
Iron Paint, Ground in oil, Bright Red.....	\$ lb 6 1/4 @
Iron Paint, Ground in oil, Red.....	\$ lb 6 1/4 @
Iron Paint, Ground in oil, Brown.....	\$ lb 5 1/4 @
Iron Paint, Ground, Purple.....	\$ lb 4¢
Litharge.....	6 1/4 @
Mineral Paints.....	2 @ 14¢
Orange Mineral.....	1¢
Red Lead, American.....	6 1/4 @
Red Venetian (Eng.) dry.....	\$1.65 @ \$1.70
Red Venetian in oil.....	ass'd cans, 11¢; kegs, 8¢
Red Indian Dry.....	8 @ 12¢
Rose Pink.....	10 @ 12¢

THE IRON AGE

THURSDAY, FEBRUARY 21, 1889.

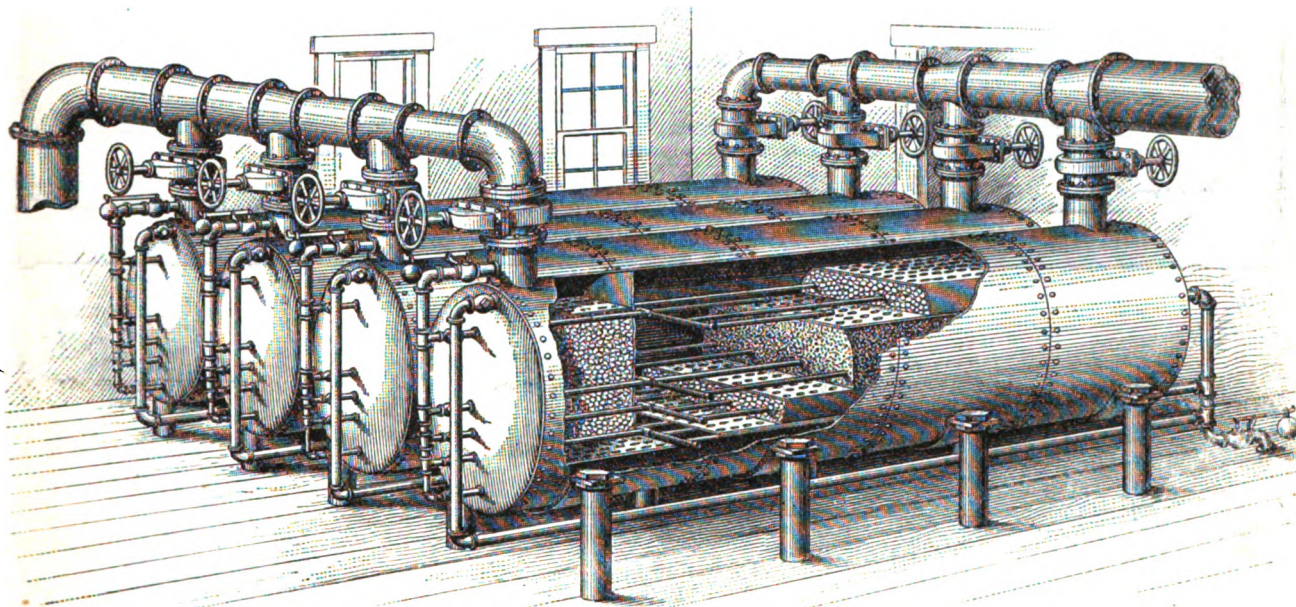
A 5,000,000-Gallon Filter.

Although the fact that water can be purified by passing it through certain materials has been long known, the purification of large volumes by mechanical filtration, without resorting to chemicals of any description, has only received close attention during the past few years. Early filters were exceedingly slow in their operation, and the quantity of water passed by them was accordingly very small, so that their capabilities were limited to a narrow range. Now it is by no means uncommon to filter the whole water supply for a city, and to accomplish this with apparatus simple in construction and of comparatively small size. In addition to this, the modern filter, having proved itself to be so reliable in operation and so economical as regards running expense, has entered

sand. The construction and arrangement of the sand and gravel beds will be understood from the perspective view, in which a portion of the shell of one of the filters is broken away. Water enters through the pipe A, its admission being controlled by the valve C. It passes downward through the gravel in the smaller chamber, under the partition, up through the gravel, sand and gravel beds in the larger chamber, and thence through the outlet pipe B. The first screen arrests any large particles which may be brought in by the water; the first gravel bed removes the larger percentage of impurities, while the purifying operation is completed as the water flows through the other beds. As the entire lower portion of the filter serves as a water chamber, the upward flow is distributed in such a manner that each section of the

in a large volume through the filter, no single part of which presents more resistance to its flow than another. One remarkable feature of this filter—which is perhaps the largest ever introduced in a single works—is the small space required. The inside measurement of the room in which it is situated is $27\frac{1}{2} \times 28\frac{1}{2}$; 10 feet would give ample head room. Simple filters of this description have been long in use under the most trying conditions and yet no cause of failure to thoroughly purify the water has appeared. These filters are made by the Hegeman & Oliphant Filter Company, of 112 Liberty street, New York.

Warming Cars With Hot Water.—The Pennsylvania Railroad has about completed the fitting up of a train of five cars



THE LARGE FILTER BUILT BY THE HEGEMAN & OLIPHANT FILTER COMPANY, NEW YORK.

all the great industries to such an extent as to form an important part of the plant.

The filter of the great Spreckels sugar refinery now being erected near Philadelphia is illustrated by the accompanying engravings. This filter really consists of four separate filtering vessels, which receive their supply from the same source and deliver into the same outlet, and yet each filter is entirely independent of its neighbor. Each filter consists of an iron shell, shaped and made like a boiler, and of sufficient strength to withstand any pressure to which it may be subjected when in use. The shells are 5 feet in diameter and 21 feet long. A vertical transverse partition, placed 3 feet from the inlet end, and extending to within 10 inches of the bottom, divides the interior of each into two compartments. Near the top and at the bottom of the partition are horizontally placed screens which divide the smaller chamber into compartments. Between the screens gravel is placed. Extending along the larger chamber are two receptacles for gravel, each of which consists of an upper and lower screen, between which the gravel is held. These screens rest upon cross rods, and either can, when necessary, be withdrawn through the manholes H. Between these two screens is a bed of fine

bed acts to retain the impurities. In other words, there is no useless or idle portion through which the water does not flow.

Provision is made for automatically cleansing the filter, if by reason of the accumulation of impurities upon the first screen its action should be interrupted. The increased pressure arising from the stoppage would raise the safety valve E, which is in the pipe E. This pipe leads from the inlet pipe A down along the front of the filter, into which five branches enter. The branches are located as shown in the longitudinal section, Fig. 2. The upper four pass through the smaller chamber, and at the entrance to the larger each is provided with a so-called "manifold," G, shown in plan in Fig. 3. The water then enters the filter through the pipe E and the manifolds G, by which it is conducted to all parts. The sand and gravel are thoroughly cleansed and any refuse on the first screen is washed through the pipe F to the sewer connections at F'. From the main body of the filter the water passes through the pipe I. It is evident that, since the water passes upward through the large beds of sand and gravel, there is no danger of packing the material, and no necessity for ever forcing the water through, while the removal of impurities is more perfect, as the water moves

with a system of heating by hot water. From the *Pittsburgh Dispatch* we condense the following description of the main features: In the sand box of the engine are placed coils of copper pipes as closely together as possible. Water, originally drawn from the tender, passes through the coils and through suitably arranged pipes in the cars to the rear of the train, and then returns to the coils through another pipe line, the forced circulation being maintained by a small pump. Entering the car, the water passes through a Y leading up through the floor, and then along each side of the car under the seats to the rear. The exposed parts of the pipe are first covered with asbestos, then wrapped in hair cloth, then paper and canvas, which is painted. At each end of the cars is an automatic stop cock, provided to close the pipes and keep the hot water in the cars in case the train breaks in two.

The new edge tool works of the Fall City Malleable Iron and Steel Company, Louisville, Ky., have recently gone into operation, employing about 20 hands and preparing for a full practical test of the Hooper-Clark process. The company will devote their capacity at first to the production of hatchets, axes and hoes.

The Wrought-Iron Pipe Trade of the Northwest.

The consumption of wrought-iron pipe is rapidly increasing in the Northwest, and Chicago is now the most important distributing point in this country outside of Pittsburgh. The local production is quite small, the great bulk of the trade being carried on by outside manufacturers. The Crane Bros. Mfg. Company and the Fieldhouse & Dutcher Mfg. Company, both of Chicago, have plants for the manufacture of butt-welded pipe of small caliber, and the Haxtun Steam Heater Company have a plant at Kewanee, 130 miles south of Chicago, but there is no mill west

population and the constant march of improvement. Within the last five years the whole system of refrigerating on a large scale has been changed, and the production of artificial cold which was substituted has required large quantities of wrought-iron pipe. The salt blocks, as now operated, take a great deal of pipe. Manufacturers of agricultural machinery are using it more and more every year, finding that while it is fully as strong as a solid bar it is much lighter, and it recovers itself when accidentally bent instead of getting set. The increasing number of high buildings in Western cities causes a greater demand for fire-escapes, and all of them are now being constructed with a wrought-iron pipe extending from pave-

pipe up to 24 inches in diameter to meet the demand for large sizes. They contemplate making up to 30 inches at an early day. No other works make wrought-iron pipe larger than 16 inches, except in England, but the large sizes are there made by hand, while the National Tube Works Company use the regular lap-welding process throughout their whole line. The competition between wrought and cast iron pipe is made on the basis of the greater strength, lightness and freedom from leakage of the former. Thus, while a 6-inch cast pipe weighs 33 pounds to the foot, a 6-inch wrought pipe of five times the strength weighs but 8.6 pounds to the foot; an 8-inch pipe shows 42 pounds against 12.8 pounds; a 10-inch pipe shows

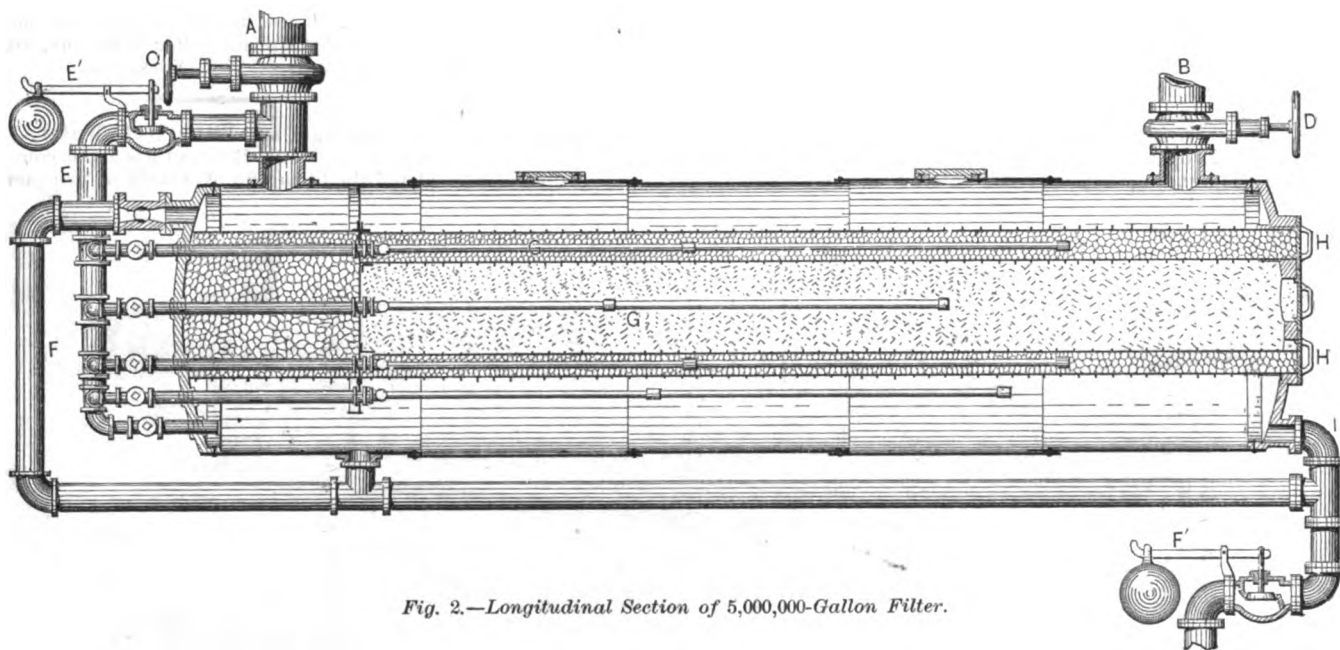


Fig. 2.—Longitudinal Section of 5,000,000-Gallon Filter.

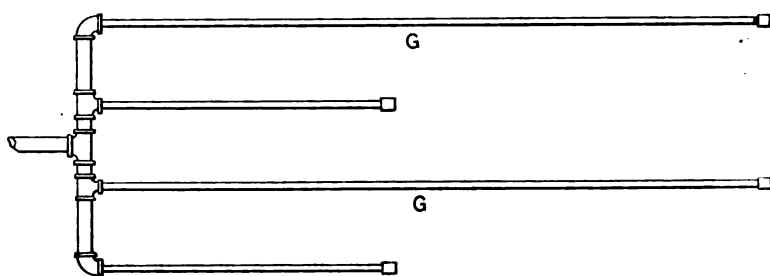
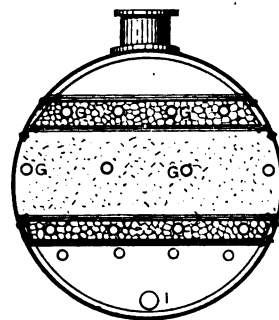


Fig. 3.—Plan of "Manifold."



Section through Fig. 2.

of Youngstown, Ohio, making lap-welded pipe or pipe of large diameters. The National Tube Works Company and the American Tube and Iron Company both carry stocks of pipe in Chicago. A. M. Byers & Co. and the Riverside Iron Works maintain resident salesmen, and several other manufacturers of both butt and lap welded tubes have established agencies with Chicago business houses having the proper trade connections. It is estimated that the annual sales of wrought-iron pipe in Chicago and its vicinity now amount to over \$4,000,000, notwithstanding sales made by mills not represented in Chicago and selling by correspondence or through travelers, the extent of which can only be conjectured.

The consumption of wrought-iron pipe in the Northwest, as in most other sections, is increasing by reason of the new uses being found for it, as well as the natural growth attending the increase in

ment to eaves to carry a stream of water to the roof in case of fire. The growth of steam and hot-water heating is also having its effect on the pipe trade, and in numerous cases wrought-iron pipe is being used as a casing for electric wires when buried in the streets.

An important field is, of course, found in the new natural-gas district of Indiana, in which more territory is constantly being opened up, requiring pipe for wells and also for distributing the gas to points of consumption. But a more constant demand for large pipes is expected in the distribution of water through Western cities. Large wrought-iron pipes are rapidly working their way into use for mains. The trade in this one item alone amounted to probably \$1,000,000 last year in the entire country, of which the greater part originated in the West. The National Tube Works Company are paying special attention to this matter, and are making

65 pounds to 16.6 pounds, and the difference continues in still larger sizes. The wrought-iron pipe of the same capacity will thus form a line about four times as long as its cast-iron competitor, weight for weight, while the increase in cost will not cover the whole of the difference. It is claimed that the joint used on the wrought-iron pipe precludes all possibility of leakage. The converse joint consists of a cast-iron sleeve, with concave grooves for the admission of molten lead, a projecting ring in the center of the sleeve of the same height as the thickness of the pipe to prevent lead from running into the pipe, and two slots into which rivets on opposite sides of the pipe engage when it is inserted and given a half turn. The pipes when laid with this joint are given an air-pressure test to insure perfection. These points, together with the difference in freight on the lighter weight, have given wrought pipe the preference over cast pipe in numer-

ous Western cities, particularly in remote localities to which freight rates are very high.

The prospective new uses for wrought-iron pipe in the West are of a similar character to those anticipated in the East. The Boston hot-water house-heating system from a central source of supply is expected to secure a foothold in other large cities, and if it does there will be a heavy consumption of wrought pipe for that purpose. The cities which are now suffering from the soft coal smoke nuisance are

is nearly 500,000 tons of ore. The company making the sale retains several thousand acres on which ore has been found, and their work of development will be begun early in the spring. The Palmer mine has produced over 500,000 tons of ore to date.

New Naphtha Boiler.

Some time since we described and illustrated the naphtha engines and boilers built by the Gas Engine and Power Company,

under the coil. The burner is a circular tube having a gap opposite the entrance and formed with holes along its upper surface. This, the main burner, is first heated by what may be termed an auxiliary burner arranged beneath it, and supplied with gas from a tank. The exhaust gas from the engine is led to a keel condenser. In engines above 16 horse-power the air is supplied by a blower run by belting from the main shaft, this insuring a more perfect combustion and more effective operation of the engine. The jacket covering the coil may be lifted off to permit access to the latter for cleaning.

The Pietzka Revolving Puddling Furnace.

According to Dr. Wedding there are seven of Pietzka's double-heap revolving puddling furnaces at Witkowitz, in Moravia, and seven others are to be added to those now erected at Zawadski. At the latter works the production of one of these furnaces is found to amount to three times that of a furnace of the ordinary type, besides which only six men are employed instead of twelve. The coal used is less by 40 per cent. in the case of the older type of the revolving furnace, and it is hoped that a further reduction of 20 per cent. will be effected in the case of the more improved form of furnace now in course of erection. The repairs are stated to be unimportant. The arch lasts for many months. The fire bridge is repaired every four weeks. The regenerators are cleaned out every fortnight, two hours being found sufficient to effect this. The heating-up of a cold furnace can be completed in five hours. The percentage composition of the producer gas used in the furnaces at this works is about as follows:

CO.	Heavy carb'ns.	Light hydrocarb'ns.	OO.	H.	O.	N.
1.4	0.4	2.3	27.8	8.9	1.4	57.8

The percentage of carbonic oxide rarely falls below 26, and is frequently above 80. It is stated that the loss of metal in this mechanical puddling furnace is somewhat less than in the ordinary one. The following table gives comparative working results of the two furnaces:

Month.	Ordinary furnace.			Revolving furnace.					
	Production.	Tons.	Loss.	Production.	Tons.	Loss.	Production.	Tons.	Loss.
First ..	57.6	9.3	105.6	29.3	6.6	87.3	24.02	....	44.8
Second	38.6	9.8	106.9	314.4	6.1	65.8	337.0	....	42.4

These results were obtained from furnaces at the Witkowitz works.

From a number of letters which have reached us it is clear that some of the readers of *The Iron Age* have construed the fact that we published in our issue of February 7 a statement embodying the claims made for the Robert process as an indorsement of it. As we distinctly stated, no representative of *The Iron Age* has yet examined the plant or investigated the process. We made no comment because that did not seem necessary with any one who is familiar with steel manufacture.

The boiler-makers in the Risdon Iron Works, at San Francisco, struck on the ground that certain iron plates being used in the repairs of boilers of the steamship Australia were made abroad.

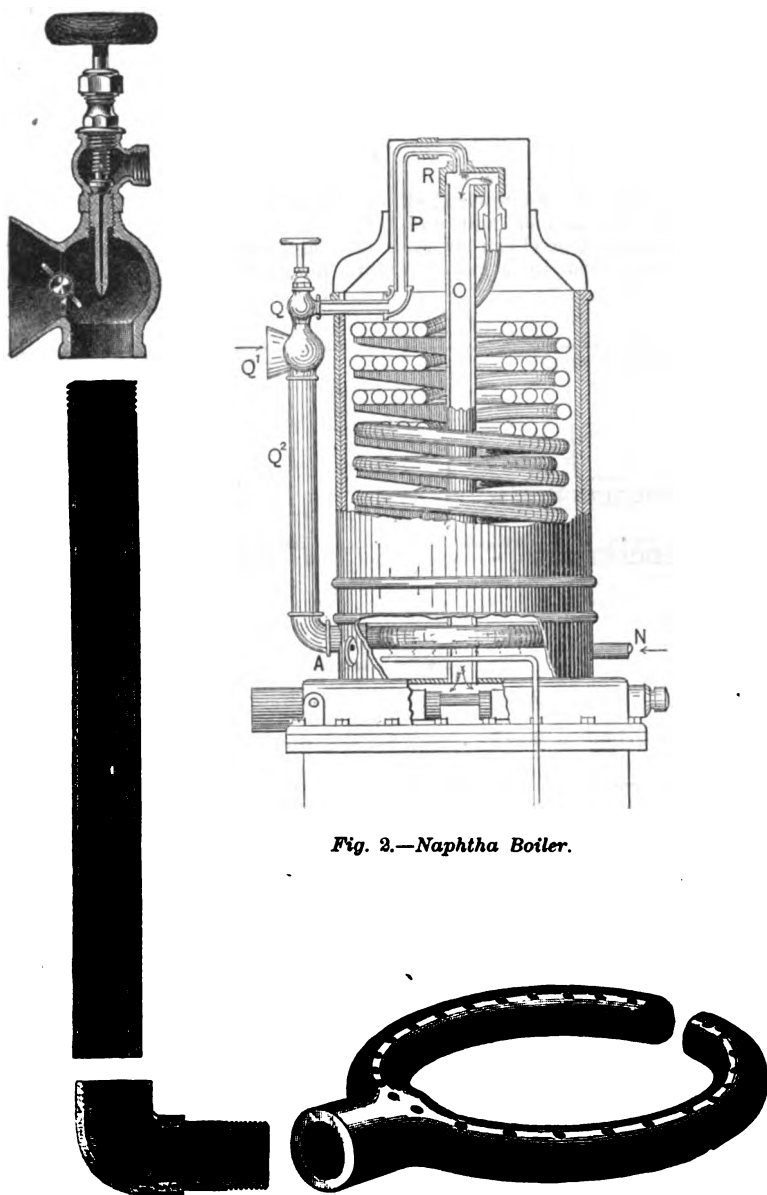


Fig. 1.—The Burner.

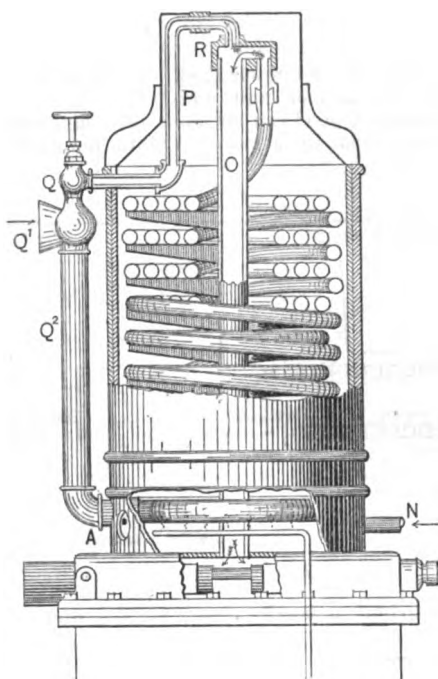


Fig. 2.—Naphtha Boiler.

NAPHTHA BOILER, BUILT BY THE GAS ENGINE AND POWER COMPANY OF NEW YORK.

niously looking for some means of relief, and there will be little obstruction thrown in the way of introducing a system of heating which will at the same time prove satisfactory to the users and beneficial to the community at large. If it also helps the pipe trade, that is the system which will meet with most favor from the pipe manufacturers.

A dispatch from Marquette, Mich., says that General Alger has bought the Pittsburgh and Lake Superior Company's iron mine for \$800,000, including 1800 acres of iron land. The mine has been a continuous producer since 1871, shipping 56,321 tons of ore last year. Its total production

of Morris Dock, New York City, for their launches. Since then several important changes have been made in the construction of the boiler, which is here illustrated. The boiler, Fig. 2, consists of copper tubing coiled as shown, each spiral consisting of four turns. The naphtha is admitted at the bottom instead of at the top as formerly. The burner, Fig. 1, is provided at its upper end with an injector, Q', supplied with naphtha gas through a pipe, P, leading to the boiler, as shown. The current of naphtha on its passage to the burner (which is lighted through the opening A in the retort) draws in air through the flaring opening Q', and the mixture thus formed burns as it issues from the small holes in the burner

Ball Bearings.

The accompanying engravings are intended to serve as suggestions concerning the use of ball bearings. The designs

have little doubt that ball bearings will ultimately be widely used for both light and heavy work, and for slow and quick speeds. Other things being equal, the fact that they reduce the loss due to fric-

being provided with a separate set of machinery, boilers, shafts and screws. Each

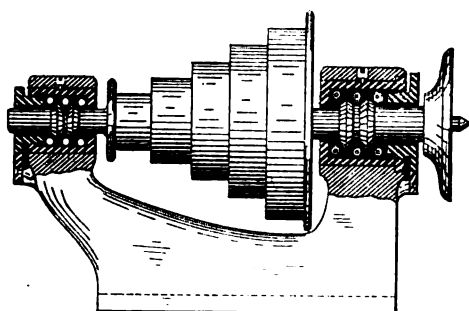
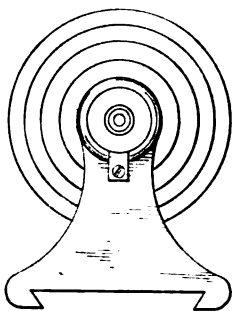


Fig. 1.—Applied to Head Stocks.

were made by J. J. Grant, superintendent of the Simonds Rolling Machine Company, of Fitchburg, Mass. An examination will show that Mr. Grant has so chosen his subjects as to embody the three principal features of all bearings, and has endeavored to eliminate the loss of power due to friction in bearings as ordinarily constructed by the use of balls. His designs are applicable to the following cases: A cylindrical shaft revolving in a cylindrical journal, a thrust bearing, and a combination of these two.

In Fig. 1 the ball bearing is shown applied to the headstock of a lathe. In this case the spindle is formed with annular ridges, which serve as both thrust and rolling bearings, the balls being arranged as clearly shown. The two next illustrations are of shafting of slow and quick speeds. In the first the balls are placed as closely as may be in a cylindrical casing surrounding the shaft. In the second case, Fig. 3, the balls are arranged in rings or circles, each ring being separated by a disk, and the shaft being provided with a sleeve. The next drawing is somewhat similar to Fig. 3, except that the balls come in direct contact with the shaft. In

tion to a minimum is acknowledged. Now that practically perfect and uniform balls of tempered steel can be obtained at a moderate cost, their more ex-

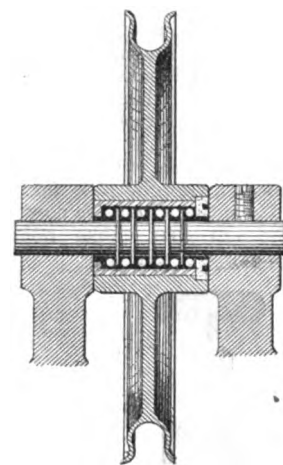


Fig. 4.—Applied to Cable Sheave.

side is again subdivided by solid bulkheads into numerous compartments. The ship

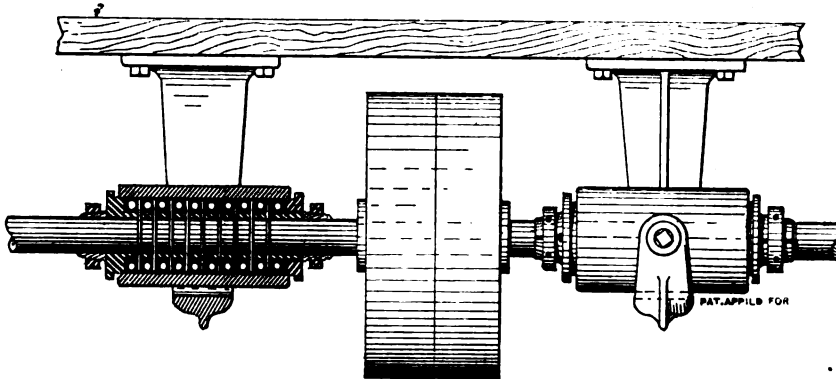


Fig. 3.—Applied to Shafting.

tended use in bearings generally seems to be assured.

The new Hamburg steamship *Columbia*, to be put on the line next spring, in some

has a double bottom. The boilers are placed in three water-tight compartments, completely cut off from one another, so that even if two of the compartments should be flooded the boilers in the third would be able to keep one of the engines working. The vessel's speed is guaranteed to exceed 19 knots, or 21½ miles, per hour.

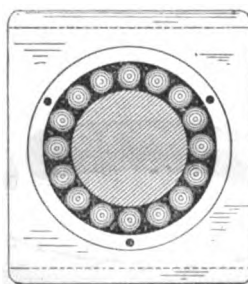
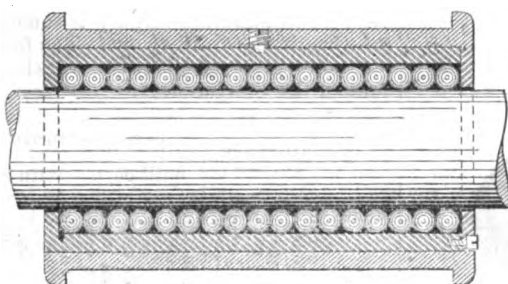


Fig. 2.—Applied to Heavy Journals of Slow Motion.

Fig. 5 longitudinal motion of the shaft is prevented by angular bearing surfaces. As applied to cranes, Fig. 6, and water-wheel steps, Figs. 10 and 11, and jack-screws, Fig. 9, where the object is simply to provide a bearing upon which the load-bearing parts may turn easily, the balls are placed in angular grooves, and support flat bearing plates, except in the case of the crane, in which both upper and lower bearings are formed of angular grooves to receive the balls. The bearing for the upper end of the crane-post resembles that for a shaft. In the case of a worm shaft, Fig. 8, the thrust in both directions is received by balls placed in angular grooves in a collar on the shaft, the second bearing for the balls being formed by the end of the journal box. The ball bearing when applied to a propeller shaft to take up the thrust is shown in Fig. 7.

The subject of ball bearings so briefly outlined in the above text, and so plainly and widely illustrated by the engravings, will bear careful and close study. We

respects represents the most advanced type of steamship architecture. The ship has a length of 468 feet, a width of 56 feet,

and a depth of 38 feet, and is of 10,000 tons displacement and 12,500 horse-power. A longitudinal bulkhead, running from stem to stern, divides the ship, each side

Encouragement of Ocean Shipping.

Measures for the upholding of our steam ocean marine are likely to receive special attention in Congress at an early day. Despite all that has been done, be it much or little, either by Congress or by State legislature, to relieve ocean commerce from needless burdens, the amount of this class of tonnage afloat steadily diminishes, although at a lessened ratio, as shown by the report of the United States Commissioner of Navigation for 1888. It is quite certain that a strong effort will be made to bring about a radical change of policy

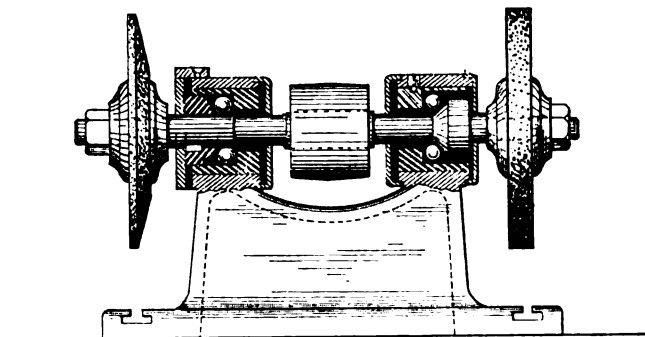


Fig. 5.—Applied to Grinding Machinery.

respecting the part which the general Government should take in the maintenance of steamship lines to foreign ports. So long as foreign governments persist in

lavishing large sums in aid of steamship lines on all principal routes of traffic, satisfied that the benefits accruing indirectly to the nation at large return a full equivalent for the amounts thus expended, just so long must Americans, less favored in the manner described, be crowded out from the field. This is a view commonly

our coastwise shipping, he said the extent of its growth "can be appreciated only by a comparison of its effective tonnage at different periods on the accepted basis of computation, which allows 1 ton

that our patriotic pride is changed to a feeling of humiliation. How great this difference is will be seen," he said, "when the statistics of the growth of our shipping in the home trade are compared

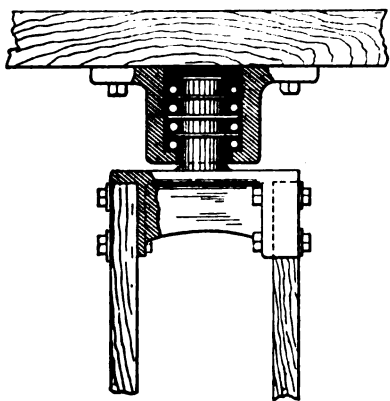


Fig. 6.—Applied to Crane.

taken and which seems to have become more firmly established in the convictions of public men.

The number who accept "free ships" as affording promise of an adequate means of relief are comparatively few. Perhaps no better indication can be cited of the prevalent tone of sentiment among the class of men destined to lead in public affairs for some years to come than is afforded by the addresses delivered before the Boston Chamber of Commerce at its annual dinner a few days ago. President Spears, in his opening remarks, said that 80 years ago upward of 100 prominent

of steam vessels to be equal in carrying efficiency to 3 tons of sailing vessels. On this basis our coastwise shipping in 1840 was the equivalent of 1,689,814 tons of sail. In 1869, after it had recovered from the disturbing effect of the civil war, the tonnage of our coastwise shipping was the equivalent of 4,800,892 tons of

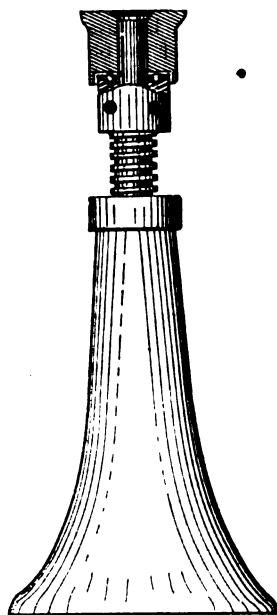


Fig. 9.—Applied to Jack Screw.

sail. On the 30th of June last this equivalent tonnage had reached 6,177,475 tons, an increase of 43 per cent. in two decades. Thus to-day we can point with pride to the fact that the home fleet of the United States has a tonnage three times that of the home fleet of the United Kingdom and

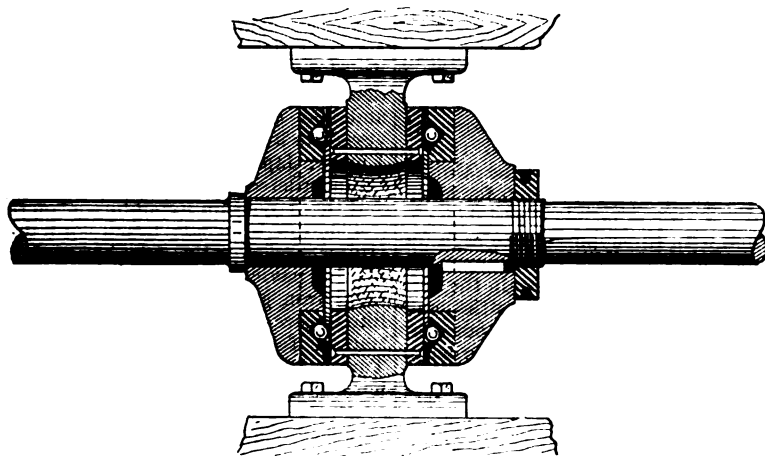


Fig. 7.—Applied to Propeller Shaft.

merchants in that city were engaged in ocean traffic representing 700 sail of vessels, not one of whom is known to the trade to-day. Ex-Governor Dingley, of Maine, who has been prominently identified with the shipping interests of that State, followed in response. First, in reference to

five times that of any other nation, and increasing more rapidly than that of any other country on the face of the earth. It is when we turn from our magnificent fleet of vessels engaged in the home trade to the small and diminishing fleet of American vessels in the foreign carrying trade

estimated that hardly more than 600,000 tons were actually engaged in the foreign trade."

Basing his remarks on official statistics Mr. Dingley combatted the assumption

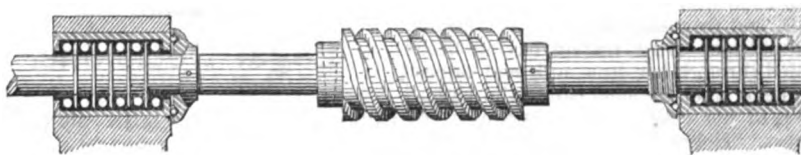


Fig. 8.—Applied to Worm Shaft.

with the official statistics of the decline of our shipping in the foreign trade. Since 1855 American vessels have been carrying each year a smaller proportion of our exports and imports, the decline having been

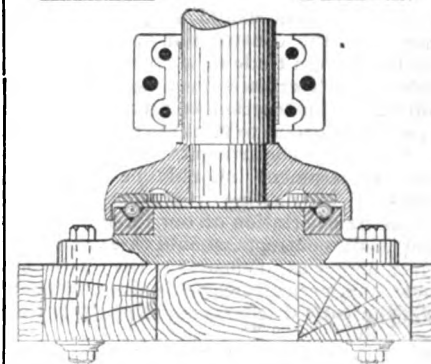
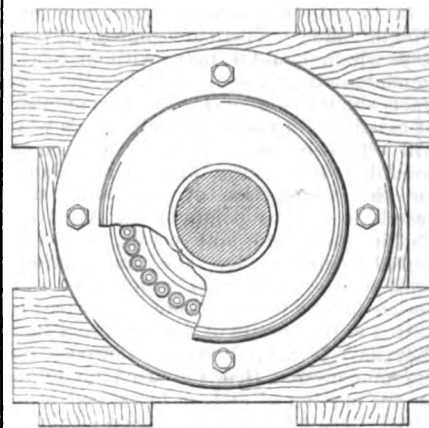


Fig. 10.—Applied to Water-Wheel Step—Wheel Above Step.

9 per cent. in value and 5 per cent. in tonnage in the six years before the war, and 14 per cent. in value and 18 per cent. in tonnage in the 23 years since the war, until at the close of the last fiscal year our registered tonnage was only 943,784 tons (only 183,897 being steam), of which it is

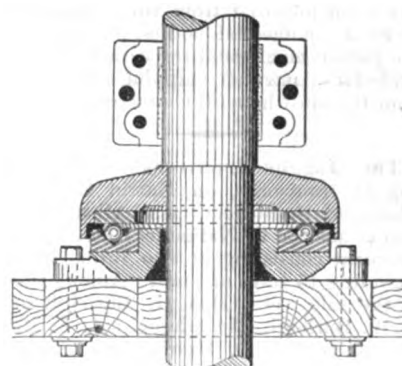


Fig. 11.—Applied to Water-Wheel Step—Wheel Below Step.

that tariff changes either since or before the war have anything to do with the general condition, our foreign commerce, our exports and imports having never increased so rapidly as during recent years. The adverse change is due, rather, to the revolution from wood to iron and steel in materials, and from sails to steam as a means of propulsion, Great Britain having been enabled through her iron and coal mines and cheap labor to demonstrate the rightfulness of her claim to the supremacy of the seas. Moreover, aside from these natural advantages, by extending aid to steamship lines by means of "postal subsidies" and profitable contracts to builders, the British Government was enabled to defy competition from any other source. Mr. Dingley contended that in the present exigency the shipping question should be grappled with solely on patriotic and commercial considerations.

In looking for practical measures, Mr. Dingley said: "There are some important steps which should be taken without delay. In constructing a new steel navy the contracts should be given to as large a number of existing shipyards and individuals who will establish such new yards as soon as possible, with a view of securing plants for the construction of iron and steel vessels at various points of the Atlantic, Pacific, Gulf and lake coasts. All imported materials for the construction, equipment, repairs and supplies of our vessels for the foreign trade should be admitted with a rebate of duty on proof that they have been used for this purpose, on the same ground that imported materials for the making of articles for export have always been admitted nearly free of duty. The Government should adopt a policy to encourage the construction of steamships for the foreign trade of a character available as swift cruisers in time of war by offering a construction bounty on all such vessels built so as to meet the requirements of the Navy Department. The policy of the Government should be radically changed in making contracts for the ocean transportation of our foreign mails, and mail contracts should hereafter be given out so as to encourage the establishment of American steamship lines, instead of practically discouraging them, as is the case now."

Senator Hoar, of Massachusetts, addressing the Boston Chamber of Commerce, represented that we can expect no large foreign market for our manufactured goods until we can exchange our products with those of other countries in our own ships. Great Britain believes that she can maintain her position as a great manufacturing nation, that she can continue to have the exchanges of the world made and the accounts settled in London, only by maintaining this trade, whether it be profitable or losing in itself. Addresses of like tenor followed from three presidents of local commercial bodies. Altogether, the feeling manifested respecting the prospects for American shipping is regarded as of the most hopeful character.

The Jagger Ironworks Sold.—The Jagger Ironworks, on Martin Garrettee's Island, at Bethlehem, near Albany, were sold at auction by Nathaniel Niles, referee, the plant consisting of two furnaces and including 15 acres of land. Among those at the sale were: Hon. G. Burleigh and B. W. Burleigh, Ticonderoga; J. F. Harris and George D. Harris, Fort Edward; Jesse Billings, Ballston; Paul Cushman, Thomas W. Olcott, and P. J. McArdle, of this city. H. G. Burleigh bid \$10,000; S. W. Rosendale, \$15,000; Fred. Schifferdecker, \$16,000; Burleigh, \$20,000; J. F. Harris, \$25,000; Paul Cushman, \$30,000, and P. J. McArdle, \$30,100. The property was finally knocked down to P. J. McArdle for \$30,100. Ten per cent.

of the purchase money was paid on signing the contract of sale. We are informed by interested parties that the furnaces and sufficient land to operate them can be purchased of P. J. McArdle at a material discount from the amount paid by him.

Legal Decisions.

PARTNERSHIP—FIRM NAME SIGNED TO SURETY BOND.

One member of a firm signed the firm name to a surety bond without the knowledge or consent of the other members, and when the bond was sued upon, payment of the penalty being refused, the defense was set up that the signature was unauthorized. Plaintiff had judgment, and defendants took the case—*Fox vs. Hittson*—to the Supreme Court of Texas, where the judgment was reversed. Judge Walker, in the opinion, said: "The bond was not made in the business of the firm, or in settling up its old business. No acts are shown of either of the other members of the firm to bind them by this bond. They never knew of it until this controversy arose, and therefore could not ratify it. No act or course of business on their part appears in the record from which an estoppel can be inferred, and there is no want of knowledge of the want of authority on the part of the member signing by the obligees in the bond. It is a well-recognized rule that where one member of a firm uses its name outside of the business of the firm, and it is so shown, that it then devolves upon the holder of such obligation to show authority for such use, which may be by direct or circumstantial evidence, or a subsequent ratification will supply authority. It is also well settled that where a firm name is used as surety for a third person, the presumption is that such use of the firm name is outside of the business of the firm, and that in such a case the burden of proving assent, estoppel or ratification lies upon the person asserting the liability of the parties not acting as signatories. The charge below was misleading, and there should have been a new trial allowed on the motion made for it. We reverse the judgment and order a new trial."

COMBINATION TO RESTRAIN EMPLOYMENT.

A corporation was created for these avowed purposes: 1, for the cultivation of music; 2, for the promotion of good feeling and friendly intercourse among professional musicians; 3, for the pecuniary relief of the members of the corporation. In their by-laws the corporation declare that no member should perform in any orchestra or band in which any person who was employed was not a member of the corporation, or should employ any such person, and they required that a residence of six months in the United States should be a qualification for membership. T. was a member, and he was threatened with three fines of \$10 each for employing non-members; whereupon he sued for an injunction to restrain the corporation from enforcing the penalties, and got a judgment. The case—*Thomas vs. Musical Protective Union*—was carried to the general term of the Supreme Court of New York, where the judgment was affirmed. Judge Brady, in the opinion, said: "The effect of the by-law as to employment, which is not necessary to carry out the purposes of corporation, is to create a close corporation and to force each member of the profession to become a member also of the union, unless he prefers to abandon his calling, or seek some locality where he can employ his talents and exhibit his capacity to procure means for his support, or that of his family, if he have any. The by-law as to residence is

arbitrary and inconsistent with the purposes of the corporation; and it operates to proscribe the foreign musician from obtaining employment. There is no response to be successfully made to the charge that such elements are not only against public policy, but antagonistic to the right of every man to earn, by honest labor, lawful in itself, whatever it will command, whether the laborer or artisan or artist be foreign or native born. It would, doubtless, be a clever mode of securing, per force, the advantages of a successful union if the exclusion from labor of all musicians not members of the union could be accomplished, but this may not be done. Unions of a benevolent or protective character should be the result of good feeling and a just appreciation of the rights of others and not arbitrary or oppressive combinations. The inciting motive to join them should be fraternal, and not an apprehension of disaster. It has been justly said that associations have no more right to inflict injury upon others than individuals have to do so. The plaintiff by becoming a member of the union did not bind himself to observe any unlawful feature of the constitution and by-laws. When they are against public policy, and in restraint of trade, and, therefore, illegal and invalid, no assent or acquiescence can bind him."

CONSPIRACY OF LABORERS.

N. and others were indicted for conspiracy to compel certain coal operators to quit working by force of threats and menaces, and the prosecuting attorney used in his argument to the jury a caricature in *Puck*, a comic paper, entitled: "Suckers of the Workingmen's Sustenance," the court having given him permission to exhibit it. A conviction was had, and the case—*Newman vs. Commonwealth*—was carried to the Supreme Court of Pennsylvania, on the ground that the use of the caricature prejudiced this case. The court, in its opinion, said: "With reference to the exhibition of the picture we cannot say that the court was wrong in permitting it. Things of this kind are very much a matter of discretion, and we are not disposed to review them unless we are satisfied that some serious wrong has been done."

War Vessels Launched Last Year.

A careful estimate places the war ships launched by the naval powers of the world in 1888 at 60, while more than 100 were building when it closed. England led with 15 vessels launched and 28 building; France launched 9 and laid down 15; Russia launched 2 and began 10; Germany put 6 vessels into the water and ordered or laid down 4; Italy launched 10 and laid down 18; Austria launched no vessel, but laid down or ordered 3; Sweden laid down 1; Denmark launched 1 and laid down another; China added 4 vessels to her navy and ordered laid down 4 more; Japan ordered 8 and launched 3; Chile ordered a new cruiser in England, and the Argentine Republic contracted for a 4800-ton ironclad; Brazil laid down a cruiser, and even Uruguay has contributed to the navies of the world, launching a small iron gunboat. The minor powers, like Greece and Portugal, have either contracted for or launched small vessels. Turkey has begun the work of building up her navy, laying down one ironclad and several smaller vessels. The United States launched 6 and laid down 6.

Modern steam hoisting machinery is to be placed on the ore docks at Cleveland by the New York, Pennsylvania and Ohio Railroad, and the line from Youngstown to Cleveland will be double tracked, \$1,000,000 having been raised in London for these objects. About \$200,000 have already been expended for freight engines.

Universal Milling Machine.

The cut here presented represents the long and well known No. 1 universal milling machine built by the Brown & Sharpe Mfg. Company, of Providence, R. I. The distinctive features of this machine were patented by Joseph R. Brown in 1865, and the original was first introduced to the attention of mechanics at the Paris Exposition of 1867, when its superiority for certain classes of work was at once recognized. The universal has all the movements of a plain machine, and, in addition, the table is fed automatically at an angle to the axis of the spindle, and the spiral head is so made and connected

68 provided for may be cut without interfering with the divisions obtainable from the index plate. The spindle may be moved through any required portion of a revolution or rotated continuously, and, by the use of the raising block, the spiral head may be set at any angle on the bed. A taper hole, $1\frac{1}{4}$ inches diameter at the small end, extends through the spindle and is fitted to receive the collets and arbors that are used in the main spindle. The front end of the spindle is threaded to receive a chuck. A piece 8 inches diameter and 14 inches in length can be swung between the spiral head and the footstock. An important addition to this machine is obtained by the applica-

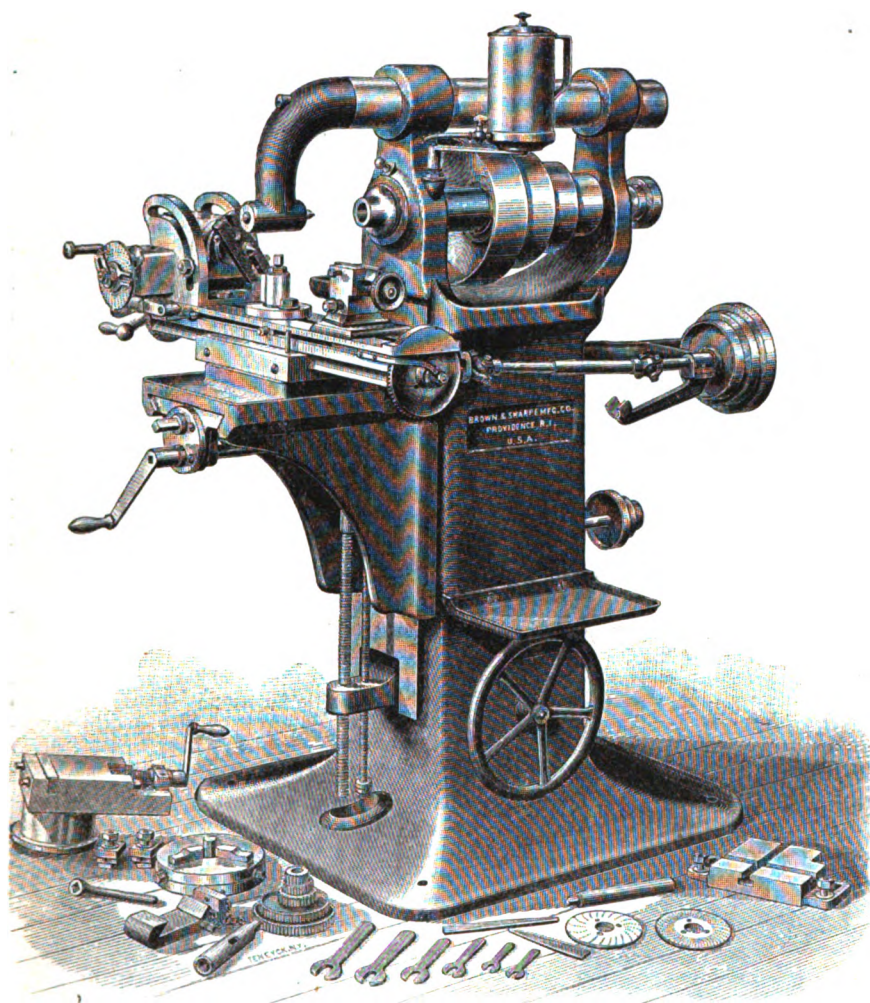
are now carefully lined and the clay packed tightly around them. When in line the centers are removed, one after another, and the clay cut out crosswise in the middle of each box. The center is then replaced and the hollow space filled by pouring in babbit. The center and remaining clay are then removed and upon the ribs of babbit (in the middle of each box) is placed the shaft, which is now accurately in line. Finally the space left is filled with babbit. In this way the shaft can be quickly and accurately lined the bearings will be absolutely true and the lining from $\frac{1}{4}$ to $\frac{1}{2}$ inch thicker than the ordinary $\frac{1}{4}$ -inch lining, consequently the shaft itself will last longer.

Electrical Exhibit at Chicago.

An electrical convention was held at the Exposition Building in Chicago this week, beginning on Tuesday and ending to-day, under the auspices of the National Electric Light Association. Much interest has been manifested by manufacturers all over the country, and the exhibition is said to have been the largest and most interesting ever seen at a convention of this kind. One of the most interesting features was an electric street railroad, 800 feet in length, laid in the main hall, by the Thomson-Houston Company. Great progress has been made in this direction during the past two years, and the fact that one company has built within that time 23 roads, all of which are in successful operation to-day, demonstrates beyond doubt that the experimental period has been passed so far as electric street railways are concerned. The Directors of the Exposition Company have manifested a lively interest in the exhibit features and offered every facility to make the convention a complete success. They are desirous of having at an early day, possibly this year, an exhibit that will completely fill the great building and will include everything electrical. They have in mind the railway exhibit of 1890, and intend surpassing it in point of interest and variety. Such an exhibit would be of great benefit to Chicago, as it would be international in scope, and therefore would excite interest the world over; as a drawing attraction it would doubtless pay for the expense incurred, as there is something mesmeric in the very word "electric."

The cruiser Petrel, building at the Columbia Iron Works, in Baltimore, will soon be ready for the official test of speed. While the contract demands that the Petrel shall develop 1100 horse-power she promises to develop not short of 1300 units of horse-power. This would mean \$20,000 additional to the Columbia Iron Works. The hull, machinery and fittings have all been constructed at the Columbia Iron Works, but the steel plates are the manufacture of the Carnegie Works, of Pittsburgh. The engines of the Petrel are compound, there being two cylinders of 25 and 46 inches in diameter respectively. The length of the Petrel is 175 feet, her extreme breadth 31 feet, depth of hold amidships 15 feet 7 inches. Her tonnage is 870. The Petrel is just about half the tonnage of the Yorktown, but her main battery is only two guns less. The Petrel is so far the smallest of the war vessels building for the new navy, but she is expected to rank among the most efficient of the fighting gunboat cruisers. The contract price is \$280,000.

In view of the interest now taken in pneumatic guns for the projection of dynamite, it is to be noted that the first tube used for that purpose was furnished from the Chicago warehouse of the National Tube Works Company. If the guns could be finished as fast as the tubes could be furnished it would require a very short time to equip the seaboard cities with these new weapons of defense.



NO. 1 UNIVERSAL MILLING MACHINE, BUILT BY THE BROWN & SHARPE MFG. COMPANY, OF PROVIDENCE, R. I.

with the feed-screw that a positive rotary movement may be given to the work. The wear of the main spindle is taken up by longitudinal movement and the end thrust is taken by a collar. The knee can be moved vertically 15 inches, and the saddle holding the spiral bed can be moved 6 inches in a direction parallel with the axis of the main spindle. The table is 28 inches long by 5 inches wide, and has an automatic feed of 17 inches. A series of graduations shows in degrees the angle to the axis of the spindle at which the table is fed, and index dials show the vertical and horizontal movements of the knee in thousandths of an inch. The spiral head has indexing mechanism by which the periphery of a piece of work may be divided into equal parts, and the velocity of the rotary movement of its spindle, or of the work, relative to the speed of the feed screw, is regulated by change gears at the end of the bed. Any spiral of the

tion of an overhanging arm for supporting the outer end of the arbor carrying the cutter. The form of this arm is plainly shown in the illustration.

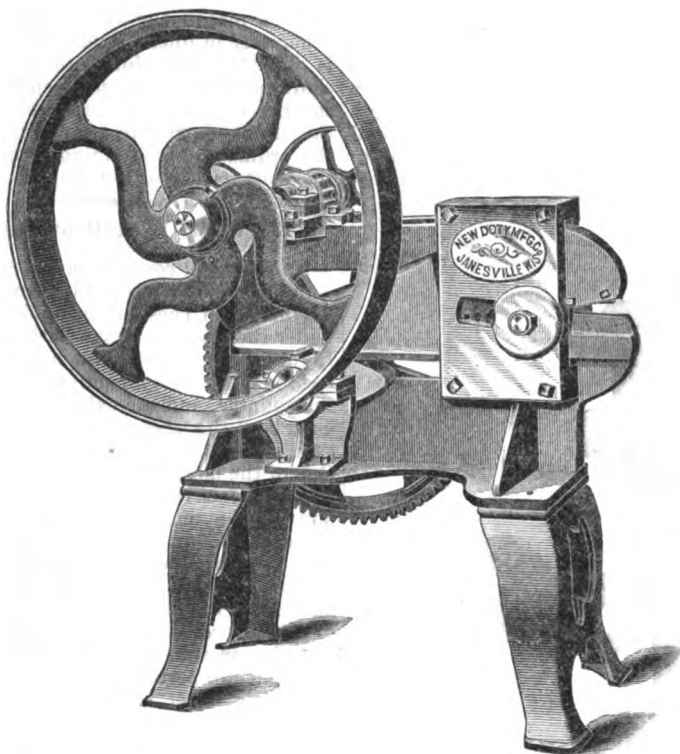
Lining a Long Shaft.—In an elaborate description by H. O. Hofman, of the Dakota School of Mines, on gold milling in the Black Hills, we take the following report of a method of lining shafts which originated with Mr. R. Graham, the millwright of the Homestake Company, and which has proved to be quick and effective. When a shaft is to be lined, the boxes are placed so as to be approximately in line. The lower bearing, which is to receive the shaft, is loosely packed with clay and a wooden center pressed into it. This consists of a semi-cylindrical piece of dry wood having the same diameter as the shaft and about the length of the box. The wooden centers of two or more boxes

New Style Shearing Machine.

The new style of shear here illustrated is especially adapted for cutting either round or flat bar iron. The machine consists essentially of a shear lever moved by a cam on a shaft passing through under the

this—that the same number of rupees would no longer exchange for the same amount of gold as formerly, but would exchange for, or, in other words, would buy as much of any commodity or commodities in India as they ever bought before. What was the relative position of the Eng-

country. He was enabled by this fall in the exchange to take the lower price of £1 10/ per quarter instead of £2 without any loss whatever to himself; in this way he was enabled to undersell them and his rivals in all other parts of the world, and not unnaturally he depressed the market price of wheat in England and the gold-using countries of the world.



SHEARING MACHINE, BUILT BY THE NEW DOTY MFG. COMPANY OF JANESVILLE, WIS.

lever, the shaft being driven by gears from a second shaft carrying the balance-wheel and driving pulley. The knives for cutting round and flat iron are on opposite sides of the king bolt, and both are always in place ready for use. The shears for round knives are made the reverse of the iron, thereby preventing the flattening of the bar in cutting; they leave a round end on the iron. The machine is back-geared ten to one, and all the parts are made strong enough to resist the greatest strain which can be brought upon them. These machines are made by the New Doty Mfg. Company, of Janesville, Wis., in six sizes, the smallest of which weighs 600 pounds, and is capable of cutting 1-inch round iron or 3 x 1/2 flat iron; the largest machine weighs 10,000 pounds, and will cut 3-inch round or 6 x 2 inch flat iron.

Silver and Wheat.

The English controversy as to the effect of the fall in silver upon the relations of British and Indian wheat growers is revived at this time by a speech of Mr. Chaplin at Abingdon, in which he puts in very clear and concise form the reasoning that the decline in the gold price of the rupee had operated as a protection to wheat growers of India. Mr. Chaplin's remarks on that point were thus reported:

The rupee in India, which was formerly worth 2/6, had now, as a matter of fact, fallen in value to very nearly 1/4d, and the fall had led to all the differences of exchange by which their interests were so seriously affected in the wheat-growing industry. However much the rupee of India had fallen in value in relation to gold, in relation to wheat and other commodities in India it had not fallen at all. In other words, what had happened was

lish and the Indian grower at the present time? Under the influence of exchange the Indian grower was realizing just the same amount as he ever realized before, while the English grower, on the other hand,

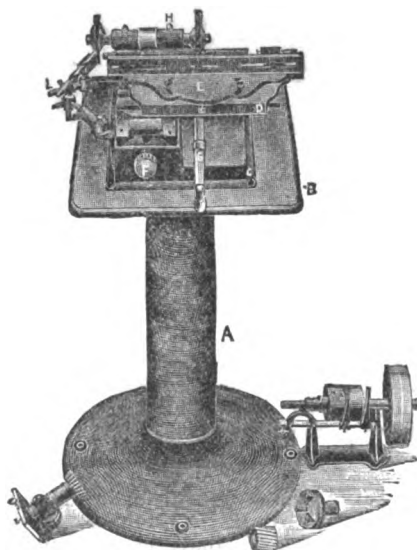


Fig. 1.

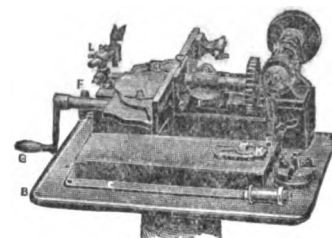


Fig. 2.

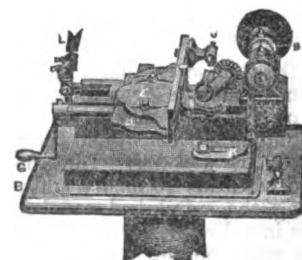


Fig. 3.

THE "CHALLENGE" UNIVERSAL CUTTER, REAMER AND FACE GRINDER

was getting less by half a sovereign on every single quarter that he sold. It must be obvious, therefore, that the Indian grower was cultivating wheat at the present time under an enormous advantage as compared with his competitor in this

tween centers, 15 inches, and traverse or cut, 12 inches; face or side cutters up to 8 inches in diameter can be ground.

This machine is made by the Diebel Sewing Machine and Trimmer Mfg. Company, of Philadelphia, Pa.

The Challenge Universal Cutter, Reamer and Face Grinder.

This machine is designed to do every variety of cutter and reamer grinding. Fig. 1 represents the machine arranged for reamer grinding, Fig. 2 illustrates face cutter grinding and Fig. 3 burr cutter grinding. In operation, reamers of any kind and shape are held between the centers of and moved at any speed along the face of the emery-wheel by means of the feed crank G, having a pinion engaging with a rack under the slide D. The adjustment for tapers and bevels is by means of the table E, which is pivoted at its center and has its bearings on the slide D, which is graduated at the arc immediately above the feed crank G, thus insuring absolute accuracy, the centers always remaining in line. The hand-wheel F moves the slide E, to which the work is secured, to and from the emery-wheel. The cutter holder, shown in position in Figs. 2 and 3, and to the left hand at the base of Fig. 1, is secured to the table E, and is so arranged that, by turning the thumb-screw, the cutter can be raised or lowered to exactly the right clearance for "backing off" the teeth. It is also arranged to swivel on its base, permitting the widest range of angle for bevel cutters, as illustrated in Fig. 3, and is graduated for the nicest adjustment. End and hollow mills, placed in a chuck and applied to this device, can be ground without trouble. The twist drill attachment L is very convenient for grinding twist drills and small tools; it is adjustable to any height or angle. The greatest distance from center of spindle to table is 10 inches; the swing, 5 inches; distance be-

THE WEEK.

A heavy tumble in ocean freights has led to a cut in rates on dry goods between the White Star and the Inman lines. The movement was precipitated by the introduction of two cheap-running steamers of large capacity, expressly built for the trade, and under the sharp competition thus arising it is probable that other lines will become involved, and the cut extend to various classes of merchandise. The tendency must be to stimulate a foreign trade that of late has assumed a magnitude beyond all precedent.

Work on the Panama Canal, where 6000 laborers were employed, was stopped on Friday. The Government of Chili offers free transportation to all competent men to engage in railway building under contracts recently concluded with American engineers. There were not many American workmen, but the American Dredging and Contracting Company, which employed most of them, had about 500, whose expenses for transportation homeward will probably be met by an appropriation from the Treasury at Washington.

One-half of the window-glass now used in this country is manufactured in Belgium, and as the importers could not be induced to join in the proposed window-glass trust, the whole scheme is said to have fallen through. There are 1305 pots in the country, and of these 1157 are in operation and 148 are idle. In the Pittsburgh district there is not an idle pot, and 350 are in operation.

The New York Building Bureau reports that the applications for the construction of new buildings the coming spring are much more numerous than usual at this season of the year, and that prospects are more favorable than ever before. The Rouso storehouse, to be erected at 549 and 551 Broadway, will be one of the largest and most extensive in the city. It will have a frontage of 73 feet and a granite and iron front, ten stories high.

Despite the opposition in Congress to the employment of steam printing machines in the Bureau of Engraving, the committees who have had the subject under consideration report adversely to the advocates of hand presses. Steam press-work, it is affirmed, fulfills the highest requirements.

Remarking upon the Senate's substitute for the Mills bill so far as concerns the single item of tin plate, Senator Aldrich said, the duty now collected with the tariff at 1 cent a pound is \$6,000,000 in round numbers. At the rate of duty proposed in the bill, to take effect July 1, 1890, 2.15 cents a pound, the revenue would be \$12,900,000. Unless he was greatly mistaken in the matter of tin plate, we shall be manufacturing nine-tenths of all we use a year after the new tariff goes into effect.

The deplorable condition of the New York State prisons, under the operation of the ill-advised legislation of last summer, received the attention of the Union League Club at its last session, Chauncey M. Depew in the chair, and resolutions were passed in favor of "adequate and liberal provision for the employment of persons confined in the penal institutions of the State in such productive labor as is adapted to the situation in which they are placed." A very decided reaction on this subject has taken place throughout the State.

Encouraged by the success of the technical school in Hoboken, the Industrial Education Association, of New Jersey, are endeavoring to establish training schools throughout the State. Among those in-

terested in the work are: Prof. Charles H. Ham, of the Chicago Manual Training School; Dr. Nicholas M. Butler, president of the Industrial College of New York; the Rev. George C. Houghton, president of the New Jersey College of Manual Training; Charles W. Fuller, State Superintendent of New Jersey, and Wayne Parker, of Newark.

American trade-marks and labels are extensively imitated in Brazil, with the object of introducing inferior goods. The penalty is evaded by a skillful use of the Spanish and French languages.

The estimates of national expenditure in the Dominion for the coming year make a total of \$35,400,000, as against \$36,739,000 last year, \$12,000,000 being interest on the public debt.

Even in its present unfinished condition, the new Capitol at Albany is by far the most costly building of modern times. The original plan of the Legislature was to expend \$4,000,000 in its construction, and with that understanding the corner stone was laid 18 years ago, in 1871. But before it had advanced to its second story it had already cost \$8,000,000, and since then the amount has been increased to \$18,000,000. The Capitol at Washington, from the laying of its corner stone in 1793 up to 1878, had cost only \$13,000,000, including all expenses of repairs, alterations and furnishing during the 85 years. The Patent Office has cost nearly as much, but it has been burned down and rebuilt. The Treasury, of a more expensive design than the Capitol, has cost \$7,000,000. The Palace of Justice at Brussels, described as "the architectural wonder of the century," has been finished at a cost of \$10,000,000.

The port of Cleveland, Ohio, famous for its shipments of iron ore, rejoices in the prospect of having the best ore docks on the lakes, the sum of \$800,000 being now available for modern machinery and other improvements.

The British steamship Chancellor, at Charleston, has made two attempts to load cotton for export, and in each instance the cargo took fire spontaneously, making it necessary to scuttle the ship.

A St. Louis company contemplate running a line of light draft steamers direct between that port and Central America, and 150,000 shares of the stock have been subscribed for by merchants in Venezuela.

There was shipped from Pittsburgh last week 180,000 feet of underground cable for electrical purposes, consigned to parties in Rio Janeiro, Brazil. This is the largest order yet received from a South American port.

President Stevens, of the National Builders' Association, in his address before the convention in Philadelphia, took strong ground in favor of the establishment of trade schools. "As regards the views expressed by the National Association on the apprenticeship system, at its first convention at Chicago, and again at Cincinnati, last year," he remarked, "they seem to have taken hold of the public and been adopted by them. The press of the country has, in many leading editorials, discussed the subject, and is busy molding public opinion. Already steps have been taken that look toward the early establishment of trade schools, and some of our public spirited citizens are devoting their means in support of such enterprises. Notably among these I may be permitted to name Col. R. T. Auchmuty, who, not satisfied with the good accomplished by his New York trade schools, which were established and are supported by him, has offered to the Builders' Exchanges of Boston and Philadelphia a very large sum of money toward the establishment of such

trade schools under the auspices of the exchanges in those cities." No mechanic, the speaker said, should look upon trade schools as a menace to his interests.

The Western packers of canned goods have 83 factories in their association, who are co-defendants in a suit for an infringement of a soldering patent.

Baltimore aspires to build up a grain export trade at that port of a permanent character, and to hold the leading position among all rivals. Since January 1 Baltimore has exported nearly 5,000,000 bushels of corn, and 194,000 barrels of flour while the movement from other ports has been comparatively insignificant. Merchants in Baltimore are now discussing the feasibility of establishing a line of steamers to Brazil, taking out cargoes of flour, grain and provisions and returning with coffee, hides and other South American products. They would doubtless expect to absorb a considerable share of the coffee trade now done in New York, in the same way that St. Louis is endeavoring to divert to Western centers the coffee trade between New York and Central American ports, which for a number of years has rapidly grown in importance. The trunk line railroad companies feel much disturbed by the tendency of the grain trade to take a new route, at least during the close of navigation.

A powerful statement in support of the gold standard was made by Herr Bamberger in the German Reichstag, a few days ago. He held that the present prosperity of Germany was greatly due to the abandonment of bi-metallism, and showed that the country held gold stock, including the bullion in the Reichsbank and private banks and the war treasure in the fortress at Spandau, amounting to 800,000,000 marks, the Reichsbank alone holding 400,000,000. Business, especially finance, was booming, he said, and all countries were coming to Germany for loans. His arguments failed to impress the majority in favor of bi-metallism, and it is determined to push the question to a division of the House.

A well-known expert, who recently visited Utah in the interest of Eastern capitalists, reports that fully 700,000 tons of asphalt now lie deposited in one of the plains near Vernal, and is available for commercial purposes. Ex-Senator Tabor, of Colorado, is interested in the company about to develop the field.

A company headed by ex-Governor Abbott, of New Jersey, is said to have purchased 2000 acres of land near Muncie, Ind., with the design of developing the natural gas advantages of that region.

Apropos of the recommendations of the National Builders' Association, at Philadelphia, in respect of manual schools, President Sheppard, of the Board of Education in that city, says: "The introduction of machinery into all branches of manufacture has changed the whole industrial world. The apprenticeship system of the past generation has become obsolete, and nothing beyond temporary expedient has yet taken its place. Industrial training in connection with our public school system appears to afford the only practicable way of solving the problem thus presented." Philadelphia, President Sheppard says, will need five or six manual training schools in a few years to meet the requirements of the people.

More "boodle" was discovered in the method of leasing the new butcher stands in West Washington Market. A Jerseyman testified that he paid \$500 bonus to an *attaché* of the Finance Department in the City Hall, whereupon the alleged offender was promptly suspended from duty by the

City Comptroller, and the practice thus disclosed was brought to the attention of the District Attorney.

Several propositions for lines of electric street cars are before the Massachusetts Legislature for the sanction of that body.

The new British Minister to Washington, it is said, will be S. Spencer St. John, now Minister to Mexico.

The New England Water Works Association dined last week at the factory of the Chadwick Lead Company, in Boston, and interesting papers were read, as follows: "The Quincy Dam," by L. A. Taylor, of Boston; "A Few Notes on Erosion and Its Effect on the Pacific Coast," by Solon M. Allis; "Experience with a Sandblast," by John L. Harrington and Phineas Ball; "How We Painted Our Stand-pipe," by J. E. Beals, of Middleboro; "How We Placed the Working Beam in the Steamer Puritan," by W. W. Hawes, of Fall River, and "An Experience with a Water Meter," by H. G. Holden, of Nashua.

Minister Preston, of Hayti, suspecting that the steamer Carondelet, at this port, was loaded with 6000 Remington rifles, powder, &c., consigned to the Dominican Consul at Samana, convenient to the headquarters of Gen. Hypolite, the steamer was intercepted by a revenue cutter.

The Mallory Steamship Line, from New York to Galveston, with extensive connections to all points in Mexico, California, Colorado, &c., has contracted for the eleventh iron steamship to be added to the fleet.

Carroll D. Wright was confirmed last week by the United States Senate to be Commissioner of Labor.

A 14-story office building in Chicago, a Gothic structure near completion known as the Owings Building, suddenly fell into ruins last Sunday. The interior was entirely of tile, supported by iron girders. The flooring in the tenth story had shown some defect, owing to the natural settling of the building, and is believed to have fallen, taking in its course the floors below, in a fearful series of concussions. The exterior walls remain undisturbed, giving no indication of the wreck within. The architects are Cobb & Frost, who have the contract to plan the great Newberry Library in Chicago, for which several million dollars have been bequeathed. F. R. Owings, a Boston capitalist, is the owner.

The commission appointed by the Governor of Pennsylvania to devise a plan for introducing manual training into the public schools of that State recommend in their bill prepared for the Legislature the appointment of special instructors who shall have tools and machinery, but it is designed that in time the ordinary instructors shall add the teaching of the manual branches to their present accomplishments. They do not provide for teaching the trades.

The substantial progress in naval construction during the last few years elicited from Senators not identified with the present Administration words of commendation. Mr. Plumb in the course of a debate last week relating to the new cruisers said "he was glad to say (in the closing days of the administration) that the Navy Department had been well administered, not only in the sense that there had been a stimulus given (so far as could be given by executive direction) to everything that went to the up-building of the navy, to procuring the best types of ships, to the stimulation of the highest forms of manufactures, but, more than all that, to the encouragement of the individual genius of the people, and to the doing of the work, not in navy yards (where political

considerations might have influence), but in private yards. He was glad to say that during the past four years the Navy Department had been administered in a practical, level-headed, judicious way. The result was that (quoting a remark made to him by Mr. Hale) he was prepared to believe within ten years the United States would have the best navy in the world—not the strongest navy, not a navy with the most ships, not a navy with the greatest variety of ships—but a navy with the most modern ships, with ships best adapted to the work they would have to do."

Mayor Grant procured the passage of a resolution by the Electric Board of Control that hereafter telegraph trunk lines shall be carried only through the city in subways.

The Central Labor Union in this city, after a boisterous meeting last Sunday, was purged by the withdrawal of the Socialist element, representing several thousand members, mostly Germans. The divisions now are hostile camps, essentially differing in spirit, practice and aims. The interests of labor, it is hoped, as well as the observance of law and order, will be promoted by separate organizations.

The claim of Chas. E. Emery for \$10,000 for services as consulting engineer in 1887 was the cause of a lively meeting of the Brooklyn Bridge trustees on Monday.

The annual report of Commissioner Hotchkiss, of the Connecticut State Labor Bureau, makes some interesting comparisons between the wages paid laboring men in 1860 and 1888, and the cost of the necessities of life in these two years. It shows an average advance in 28 years in the wages of males of 43 per cent., and in the wages of females of 57 per cent. During the same time the increase in the cost of groceries and provisions has been only 10½ per cent., while staple dry goods show an average reduction of 39 per cent.

Capt. F. M. Ramsay succeeds Rear-Admiral Gherardi as commandant at the Brooklyn Navy Yard.

The United States Consul at Rio Grande do Sul reports upon the condition and prospects of trade in Southern Brazil. Most of the vessels crossing the bar go as far as Pelotas and many as far as Porto Alegre, which is the terminus of a railroad penetrating the center of a large German colony at New Hamburg, 26 miles distant. The steamers of 11 different lines, of from 10 to 80 tons burden, leave its docks regularly for all accessible points up to different rivers. Porto Alegre has 44,000 inhabitants, of whom 14,000 are Germans. The chief American goods sold there are kerosene oil, flour, Collin's axes and some stoves for cooking purposes. The whole country is filling up with emigrants from Europe, and will prove of great value to those who have established a trade.

A decision in England by the Lord High Justices of the Court of Appeals gives Edison an absolute monopoly of the incandescent light in that country by upholding his patent. Practically the same points are before the courts in the United States.

M. de Lesseps rejected an offer by the Credit Foncier to advance \$400,000 a month for six months in aid of the completion of the Panama Canal upon the security afforded by the old company's assets. The governor of the institution, M. Christophle, made it one of the conditions that he should act as chairman of the new organization and select two-thirds of the directors. These terms being rejected, it remains to be seen whether any other feasible plan for completing the work can be devised.

MANUFACTURING.

Iron and Steel.

We are informed that the report that the Stewart Iron Company, Limited, of Sharon, Pa., had recently purchased 14 acres of land with a view of enlarging their plant is not altogether true. It is correct that a purchase was made, but it was for the purpose of affording additional storage room. At present the company have no intentions of enlarging their plant.

Emma Furnace, of the Union Rolling Mill Company, Cleveland, Ohio, has been blown out for extensive repairs. The company have a sufficient amount of pig iron on hand to supply their trade until such time as the furnace has resumed blast again.

The No. 2 mill of the Washburn & Moen Mfg. Company, at Worcester, Mass., was badly damaged by fire on Friday night. The mill was used for drawing copper wire and making bale tie wire. The building is 175 x 50 feet and four stories high, with a full basement. The fire broke out in the third story, and burned up into the upper story, destroying the roof, badly gutting the floor below, and considerably damaging the third floor. The entire building was deluged with water. The loss will be in the vicinity of \$80,000, which is covered by insurance.

On Friday, the 15th inst., the employees of the Pottsville Iron and Steel Company's Fishback Rolling Mill were notified of a reduction from 10 to 15 per cent. in wages, to take effect on the 18th inst. The reduction affects about 700 men. It is thought it will be accepted by the men without trouble.

On Friday, the 15th inst., notices were posted on the nail factory of the E. & G. Brooke Iron Company, Limited, at Birdsboro, Pa., asking the 300 employees of the works to accept a reduction in wages to take effect on March 1. The firm recently reduced the wages of their puddlers from \$3.25 to \$3 per ton.

A reduction in the wages of all men employed in the pipe and rolling mills of the Reading Iron Works, at Reading, Pa., has been announced to take effect on Monday, the 25th inst. Common labor is reduced from \$1.15 and \$1.20 per day to \$1, and the wages of all other employees are lowered 10 per cent.

From the South Cleveland (Ohio) *Advocate* of the 11th inst. we take the following: "A conference of the Cleveland Rolling Mill Company's rail-mill employees was held with Superintendent John Walker, last Saturday afternoon. Finally a proposition was made to start the rail mill single turn, the old blooming mill double turn—one turn on rail blooms and the other on billets, providing those making good wages would accept a reasonable reduction. The men working for small wages it was not expected could work for less. The men considered the company's proposition, and, as it was made in good faith to help all concerned, they accepted it. This arrangement will keep the Bessemer steel works running full, employing 325 hands."

H. K. Porter & Co., Limited, of Pittsburgh, builders of light locomotives, made the second annual distribution of a percentage of the profits among their employees last week, and quite a large sum was given to the men.

The St. Louis Ore and Steel Company have been filling the stock houses of their furnaces for two or three weeks, and expect to blow in "C" furnace in about a week. The re-starting of the steel

works depends upon whether the steel rail market improves.—*Age of Steel, St. Louis.*

No. 3 Furnace, of the Pottsville Iron and Steel Company, at Pottsville, Pa., has been blown out owing to the dullness in the iron trade.

A press dispatch from Steubenville, Ohio, under recent date says: "The Jefferson Coal and Iron Company, of Steubenville, have obtained judgment by default against the Cartwright Iron and Steel Company for \$4166, and will immediately commence suit against the stockholders, a large number of whom live in Youngstown, Ohio, upon their statutory liability."

The steel department of the Bellaire Nail Works, at Bellaire, Ohio, is making its regular output under the direct process, the whole product of the blast furnace going direct to the converters.

Some time since announcement was made in these columns that Jones & Laughlins, Limited, proprietors of the American Iron and Steel Works, at Pittsburgh, had decided to pipe natural gas from their own wells, located in Jefferson Township, Washington County, Pa. The firm have completed this undertaking, and are now independent of the local gas companies. The main is 16 and 12 inches, and the firm has three wells of 500 pounds pressure, ample supply for the large needs of the establishment.

P. Minturn Smith, long connected with the Phoenix Iron Company, in this city, has recently assumed the presidency of the Union Iron Works, of Greenpoint, L. I., manufacturers of structural iron-work of all kinds. The offices of the company are in the Aldrich Court Building, 45 Broadway.

Irondale Furnace, at Irondale, W. T., has now been running for some time. A report by A. B. Ropes, engineer of tests of the Southern Pacific Railroad, who use the iron largely for car-wheels, shows the following analysis of No. 8 iron:

Total carbon.....	3.51
Silicon.....	0.721
Phosphorus.....	0.339
Manganese.....	0.130
Sulphur.....	0.019

Mr. Ropes adds: This iron contains much less silicon, phosphorus and manganese than the English brands, and there are no signs of vanadic acid, which was found in all the English irons and weighed with the silicon.

Machinery.

In our last issue a mistake crept into the description of the Nash gas engine, built by the National Meter Company, of New York. We stated that the floor space occupied by the 2 horse-power engine illustrated measured 25 x 85 inches. This should have been 25 x 35. We cheerfully remedy the error, as far as lies in our power, and especially as the engine is small and compact, considering the power developed.

On Monday, the 11th inst., a charter was issued to the Electric Hydraulic Company, of Pittsburgh. The incorporators are J. P. Witherow, R. F. McFeely, H. F. Floy, M. H. Herron and F. J. Edmundson. The capital is \$10,000, divided into 400 shares. It is for the manufacture of electric and hydraulic machinery.

A foundry is projected at East Chicago, Ind., for the manufacture of chilled rolls and other heavy castings and special work not hitherto attempted in that section of the country. A new process will be used in the construction of large rolls, which, it is claimed, will greatly reduce their cost without impairing their strength or durability. The rolls will be cast hollow, and a core of silica will be inserted, which is

expected to form a center of the necessary solidity. The promoters of the works claim that they have thoroughly tested their process and have demonstrated its practicability, while as to its economy there is no doubt. Plans for the foundry building are now in hand.

The Lloyd Booth Company, proprietors of the Falcon Foundry and Machine Works, at Youngstown, Ohio, since adding a roll turning department to their foundry have been prepared to turn out a complete rolling mill outfit, and have now under way an 18-inch mill, which is nearly completed. They have also under way one of their modern designs of squeezers for a plant in Tennessee. With their air furnace they are prepared to furnish their customers with refined iron and steel mixed castings. They have had a good trade in their extra heavy axle and rail shears, weighing 24 tons, having sold three within the past six months.

A. W. S. Smith, of West Oakland, Cal., would like to purchase a machine for the manufacture of excelsior.

Contracts have been awarded as follows by the Secretary of the Navy for furnishing machines and tools for the Mare Island Navy Yard, California: Joseph J. White, Philadelphia, drilling machines, \$875; Universal Radial Drill Company, Cincinnati, counter sinking machines, \$680; George Place, New York, one 250 horse-power engine, \$16,800; Detrick & Harvey, Baltimore, planing machines, \$3520; Bement, Miles & Co., Philadelphia, planing, punching, straightening, bending, countersinking and drilling machines, \$16,020; Niles Tool Works, Hamilton, Ohio, punching, shearing, bending and straightening machines, \$48,598; James W. Soper, New York, Crane foundry rattler, 100 ratchet drills, \$2390, and the Builders' Iron Foundry, Providence, R. I., hydraulic accumulator, \$2700.

The Westinghouse Air Brake Company, through their superintendent, T. W. Welsh, have placed an order with Manning, Maxwell & Moore, of New York, for 214 21-inch lathes for the new shops now being constructed. This is probably the largest order ever placed for this class of machine tools. Manning, Maxwell & Moore naturally feel gratified at the successful result of their competition, not only on account of the size of the order, but also because their tools met the very exacting requirements of the Westinghouse people and were accepted entirely on their merits.

The National Pipe Bending Company, of New Haven, Conn., report that during January they sold over 40 National heaters, aggregating over 4000 horse-power. A large number of these were for electric light plants, including three heaters of 500 horse-power each and seven from 100 to 200 horse-power. They also report the sale of a large number of coils and bends of iron, brass and copper pipe; three of these coils of 1½-inch iron pipe contained 1000 feet of pipe each.

T. R. Palmer, assignee of the St. Paul Iron Company, of St. Paul, Minn., announces that bids will be received by him up to March 1 for the property of the concern, consisting of manufactured and partly manufactured goods, foundry tools and equipment, machinery and real estate.

Hardware.

The Cuyahoga Mfg. Company have been organized at Cleveland, Ohio, for the manufacture of burglar alarm knobs and window alarms. The office of the company is located at No. 61 Grand Arcade Building, in the above-named city.

J. H. Day & Co., Cincinnati, Ohio, had their factory damaged by fire, 12th inst., the loss being estimated at \$4000, which is fully covered by insurance. Their stock-

room, however, was but little damaged, and they state that they have enough of their regular machines and other goods of their manufacture to fill orders until they get their factory in operation again, which they expect will not be over 10 days.

Coleman Hardware Company, Chicago, Ill., report a large demand for their J. G. C. spring hinges, which has compelled them to largely increase the force manufacturing them.

Nes Chain Mfg. Company, York, Pa., announce that they have erected a plant for the manufacture of all kinds of Iron Chain and start operations at once, intimating that they will be ready to supply promptly all orders for shipment March 1 and later. Chas. A. Nes, the managing partner, was connected with John C. Schmidt & Co., and his brother, David S. Nes, is the other member of the firm. Chas. P. Leeper, formerly superintendent of York Chain Works, is superintendent. They issue a price list showing the extensive variety of chains which they are manufacturing.

A new company, known as the Harrisburg Rolling Mill Company, have taken the Lochiel Mills at Harrisburg, Pa., and are putting them into shape for immediate starting up. Among other improvements they have ordered a plant of Ridgway Balanced Cranes, by which they will load the entire product of all the mills with only one man.

The plans of the Passaic Rolling Mill Company, at Paterson, N. J., have grown in magnitude. Besides the open-hearth plant alluded to, the company will build a new blooming mill, and will move its beam train. The new mill completed last year is making universal mill plates. The same engine, of 2500 horse-power, drives also a two-high beam train, the only two-high train in this country. This train is not yet completed. It will make up to 20-inch steel beams.

Ramie culture is being introduced into Lafayette Parish, La., and large decorticators have been erected. Successful experiments prove that ramie can be grown at about the same cost as cotton. A New York firm offers 4 cents a pound for all the fiber that can be grown. Experiments having similar objects are being made in Florida by D. P. Burden, formerly of New Jersey, who is cultivating the Spanish maguery plant, and has recently exhibited some very white and strong fibers. Experiments at Sanford show that after the first year the maguery plants yield 60 tons of leaves per acre every year. From this amount 12 tons of marketable fiber may be obtained. Mr. Burden's estimates of cost and value show large profits to farmer and manufacturer. The most important part of his work, however, appears to be that he has invented a machine for cheaply and effectively extracting the fibers from a large class of Florida plants producing fibers in pulp as distinguished from bark fibers. Wm. D. Kelley, of Pennsylvania, has taken a warm interest in the development of this industry, in hopes of providing an American substitute for manila hemp.

The Government Ordnance Foundry at the old Washington Navy Yard has been turning out some excellent work. The six 6-inch guns for the battery of the cruiser Charleston have been finished and will be tested. They are savage looking appliances of modern war. They will be mounted at once after the test and the vessel will be put in commission without waiting for her two 8-inch guns.

The Iron Age

New York, Thursday, February 21, 1889.

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF, JR., - EDITOR.
GEO. W. COPE, - - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS, - - HARDWARE EDITOR.
JOHN S. KING, - - - BUSINESS MANAGER.

Trusts and Legislatures.

It is becoming more and more evident that a large number of our citizens are not disposed to agree with those, among whom Andrew Carnegie is a conspicuous example, who advocate a *laissez faire* policy in regard to trusts. It may be true that these organizations carry in their inception the germs of a disease which must ultimately lead to their dissolution. It may be true that the consumer will be ultimately avenged by the break-down which must follow the flow of capital into channels made artificially tempting. In isolated cases great manufacturers like Andrew Carnegie may realize that a wise, far-seeing business policy dictates opposition to fusion of interests in the form of a trust, yet the number who hold this view seems likely to decline, for one reason. We believe that organization in manufacturing tends in a direction which will lessen the influence of individuals. The number of firms and families who control large operations is diminishing, while there is a steady increase in corporations with scattered and temporary ownership. Capital is becoming more and more mobile. Family traditions and personal knowledge do not have as much weight in determining investments in enterprises as they did. Many capitalists do not go into manufacturing corporations with the object of staying in the business all their lives. They invest with the object of selling out at a profit as soon as possible. With the growth of this spirit the opportunity for "getting out," on the part of directors, managers and stockholders, through the aid of large temporary profits under trust régime, is much improved. The desire to form trusts grows, the resistance to them by manufacturers themselves decreases. We think, therefore, that there is some justification for the alarm shown by consumers, and it is a poor consolation to tell them that though they may be subject to extortion for a while their time is bound to come. The promise of future compensatory benefits does not mitigate a keen sense of present grievance. The danger is that the irritation and uneasiness created by real or fancied wrongs may lead to harsh and radical measures.

We must look the facts in the face. It is certain that the question of dealing with this new form of aggregated capital is profoundly agitating the public. It is being discussed by thoughtful and earnest students of our economic system, and is being seized upon by selfish demagogues to advance their own schemes. Bills are being brought before our State legislatures in rapid succession. On the same day measures were proposed in the Minnesota Legislature and in the Pennsylvania Senate. In Kansas an act was passed leveled against an alleged combination in beef and pork, and a similar measure has been lately dis-

cussed in Illinois. In New York the agitation has begun some time since, and in Ohio a committee appointed by the General Assembly to investigate trusts has just made a sharp report. In the United States Senate, Mr. Reagan has lately proposed a characteristically sweeping measure. The newspapers throughout the country teem with condemnatory articles, and often sensational reports of oppression and extortion. Let it be conceded that much of what is written and said is very crude and often absurd. Let it be granted that the facts are distorted until it seems a hopeless undertaking to place them in their true light. Yet a deep impression is being made, and any organization which can be possibly classified as a trust in the widest interpretation of the word is held up to public odium and enmity. The movement is undoubtedly gaining both in volume and in strength.

Some of the measures proposed are very harsh. The following summary of the provisions of the bill introduced in the Minnesota Legislature may serve as an example:

The first section makes it unlawful to enter into or maintain any combination or agreement to prevent or restrict the production of any article of commerce or to regulate or control its market price.

The next section makes it unlawful to make or carry out any agreement to produce any article of commerce below a common standard or figure; or to in any way interfere with free and unrestricted competition in the sale of such article; or to pool or combine in such a way as to affect its price. The third section is like the first two. It seeks to prevent indirect combinations through trusts, trustees or other fiduciary agents. The fourth section makes any contract in violation of these sections void in law and equity.

The fifth section goes further and gives the purchaser of any article whose price is affected by trusts the right to plead the act as a defense for not paying for the article. The sixth section declares any officer or agent violating the act guilty of felony, punishable by a \$5000 fine or a two-year imprisonment, or both. Under section 7 a corporation which violates the act forfeits its corporate rights and franchises, and the Attorney-General of his own motion must institute an action for the dissolution of its corporate existence.

Section 8 seeks to prevent corporations which have violated the act from doing business or maintaining suits in the State, and any officer who transacts business, knowing the corporation to have violated the law, is to be guilty of felony. The last section permits associations of laboring men to take action regulating wages, and none of their rights or privileges is to be forfeited under the act.

Bills so sweeping in their provisions are not likely to become laws, and if they do, cannot remain long on the statute books. It is the spirit that makes even their presentment possible which must be dealt with. It is characteristic of much of what is written and said that condemnation does not stop at the trusts proper, but includes trade associations and combinations of all kinds. We have insisted repeatedly that a sharp distinction must be made, and we are pleased, therefore, to find in at least one case that the matter is viewed in this light. The report of the Ohio committee contains the following:

The most common form of combination is the simple agreement, verbal or written, to fix and maintain prices at a certain point. While this form of combination works injustice to consumers by unjustly advancing prices, it is short lived, and because of advantage gained by some members over others the agreement is soon broken. The next form, an agreement on prices the violation of which is enforced by

fines or forfeiture of money deposited, is stronger, but in both of these forms of combinations the principle of self-interest remains, and by reason of the fact that some one of such combination is sure to reap a greater advantage than another, such combinations have within themselves the elements of destruction, and it was this fact which led up to that form of combination called the "trust," in which all the elements of self-interest are eliminated, and each member of the combination, in proportion to his share, receives his proportion of the benefits.

We believe that while it may be just to condemn trusts, it does not follow that severe restrictive measures should be passed against ordinary trade combinations. However much opinions may differ in regard to their efficacy, it is certain that at times they are beneficial temporarily to the producer, and protect the consumer against the incidental dangers which are only too often the outgrowth of cut-throat competition.

The Pig Iron Warrant Scheme.

We print elsewhere the second part of the correspondence relating to the plan of establishing a system of American pig iron warrants, the first part of which was published in *The Iron Age* of February 14th. We appreciate the fact that, being almost wholly anonymous, the evidence loses a part of its weight. The views of men are placed side by side whose opportunities for careful study of an important subject and whose aptitude in expressing their convictions vary as widely as those of an equal number of men in business must necessarily. We may admit that a sacrifice is made when the opinion expressed is divorced from the personality of the writer. It would be absurd to canvass the matter as though a vote had been taken, and say: Ten furnacemen answered "yes," and three replied "nay." The prestige of the three, the magnitude of their business interests, the energy of their individuality might more than counterbalance the greater number of their opponents.

It would be a very difficult task for the one disinterested spectator, the only one possessing the data to measure the forces arrayed, to state his conclusions on the question with which side rest the weight of opinion and the preponderating influence. We may state that men of the highest standing, manufacturers and consumers, who would rank among the first in the councils of the trade, are on both sides of the question. In the entire discussion the point whether the chances for success are good, poor or indifferent has been little raised. As we pointed out, its solution will partly at least depend upon the attitude of the pig iron producers, and it was largely our object to throw light on this point. We believe that we have succeeded quite well. Our inquiries were sent out without any bias, without any attempt to call out principally the views of men whom we imagined to be either in favor of or opposed to the scheme. We may confess to some surprises. Producers from whom we expected unqualified assent have turned out to be opponents of the plan. Others whose interests seemed to lie in another direction have given it their support.

Among commission merchants there is the same diversity of opinion. On the whole, however, we incline to the belief

that a change of heart is likely to come quickest with this interest, so soon as developments should point in one or the other direction. In other words, their business methods probably possess relatively the greatest elasticity, and would adjust themselves to new conditions with the least friction.

To consumers, taking the largest number of replies into consideration, a good many of which we have not printed, the subject seems to possess comparatively remote interest. The majority of those who have studied the subject as it may possibly affect their business are inclined to regard it unfavorably, although there are important and conspicuous exceptions.

One feature must not be lost sight of, and that is that those who are pushing the plan, and many who sympathize with them, are likely to be far more active in their partisanship than the greater majority of those who are against it. Their opposition will probably be limited to passive resistance. They are not likely to rally in a manner which will make their hostility very effective. The scheme, so far as we are able to gauge the situation, must stand or fall upon its own merits. The difficulties are certainly very great. Different phases of them have been pointed out by some of our correspondents. It will depend upon later developments whether or not they will be overcome. The outlook is certainly not very encouraging.

Drawbacks on Exports.

Our tariff laws provide for the payment of a drawback on merchandise imported, subsequently manufactured and exported, to the extent of 90 per cent. of the duty, 10 per cent. being retained by the Government. Exact data on the magnitude of this business rarely reach the public, so that particular interest attaches to the figures lately submitted in a quarterly report of the Bureau of Statistics. For the past four years the figures have been:

Drawbacks on Exports.

Year.	Drawback.	Retention.	Paid.
1885.....	\$3,793,792	\$270,857	\$3,524,935
1886.....	7,822,973	278,619	7,544,354
1887.....	7,557,808	270,976	7,286,832
1888.....	3,108,905	219,548	2,889,357

The principal article on which drawbacks have been granted and on which the retention did not amount to the usual 10 per cent. was sugar, the details being:

Drawbacks on Sugar.

Year	Drawback.	Retention.	Paid.
1885.....	\$6,763,528	\$67,635	\$6,695,892
1886.....	5,703,711	66,908	5,636,803
1887.....	5,535,220	68,718	5,466,502
1888.....	1,097,531	18,413	1,079,118

These figures sufficiently explain the falling off noted particularly in the fiscal year 1888. Turning now to the articles in which the readers of *The Iron Age* are particularly interested, we tabulate as follows the amounts of the drawbacks, the retention being 10 per cent. in every case:

	1885.	1886.	1887.	1888.
Copper.....	\$38,802	\$101,420	\$102,751	\$106,589
Iron and steel:				
Iron.....	32,321	22,736	23,197	27,536
Iron and st'l.	45,010	96,691	34,957	27,015
Steel.....	6,868	24,295	62,973	77,397
Lead.....	35,089	15,156	10,738	11,316
Tin.....	1,271,269	1,365,393	1,232,086	1,082,715

Unfortunately, the articles are not more closely specified in the case of iron and

steel. The bulk of foreign raw material used by American manufacturers to cover export sales are slabs and plates for cut nails, tacks, &c., wire rods for barb wire and wire nails. The tin is, of course, tin plate imported for making the tin cans for petroleum cases, for fruit and vegetable canneries, &c. The bulk of the lead goes for the same purpose, being used for the solder. It is understood, as is natural, that the Standard Oil Company is the chief beneficiary of the drawback system, even the wire nails for the petroleum cases for export being manufactured from foreign stock.

The Development of the Sugar Interest.

There are few articles of prime necessity that have led to so much discussion for 18 months past, not only in the United States but all over the world, as sugar. Like all raw produce this staple had depreciated considerably while overproduction lasted, and some four years ago both cane and beet sugar were selling in the world's markets at a downright loss to the producer. Since then, assisted by low prices and abundant fruit crops, consumption has gradually increased sufficiently to restore the equilibrium between the supply and demand, speculation for a rise has successfully co-operated in mending values, improved processes of manufacture have been applied, and last year has been generally prosperous to the producer of the raw article. An important manufacturing interest has meanwhile been put in a shape showing better returns locally, while checking in its own interest a too rapid advance in the raw staple. We mean the sugar refiners' trust, to which the leading refiners on the Atlantic Coast together with one of the concerns on the Pacific acceded as partners and shareholders. These refiners some time in the fall of 1887 consolidated their interests in the amount of \$50,000,000 of watered capital and managed matters so cleverly that on this capital they cleared last year a dividend of 10½ per cent. Early this month the trust certificates advanced in a couple of days from 75½ to 87½, 20,000 certificates passing out of the hands of original holders on the occasion. There has been much agitation in and out of Congress, as well as in our Legislature, about the legality from a constitutional point of view of this and other trusts; there have been suits to test the matter, but it has as yet not been clearly shown that they can be seriously hampered or upset by legal process.

The effect of the sugar trust's management has been so important during the last year that it has overshadowed other events affecting the staple, not only in this country, but to a considerable extent in Cuba and even in Europe. As it was the object of the trust to exercise control not only over the manufactured article, but quite as much over the cost of the raw staple, the managers of the trust resolved to import for their account the bulk of the sugar needed. In this manner they discouraged the usual importation in the shape of consignments and orders for importers' account. While raw sugar, cane in particular, was thus as much as possible prevented from rising here and in the producing countries, the trust fixed a much higher percentage of margin as the remuneration for refining than had ruled

prior to the formation of this monopoly. Thus where in 1887 their net profit had been ½ cent per pound, they doubled it after the consolidation had been effected, and even secured a larger percentage of profit when, during the summer of last year, an extra demand for refined arose and continued for months. Claus Spreckels at San Francisco and some Philadelphia refiners, while declining to join the trust for reasons of their own, of course reaped all the advantages incident to the course of the market; this, however, has not deterred the former from building an anti-trust refinery on a gigantic scale in Philadelphia. The most remarkable feature in the trade is that in spite of the higher prices consumers of the refined article have had to pay there has been a heavy increase in the consumption:

Sugar Consumption in the United States.

	Tons.		Tons.
1888.....	1,469,997	1883.....	1,164,391
1887.....	1,397,356	1882.....	1,077,949
1886.....	1,399,079	1881.....	1,008,932
1885.....	1,245,574	1880.....	907,109
1884.....	1,265,283	1879.....	881,806
Total.....	6,767,289	Total.....	4,990,277

The average yearly price of granulated (refined) for each of the past ten years has been as follows:

	Per 100 lbs.		Per 100 lbs.
1888.....	\$7.18	1883.....	\$8.65
1887.....	6.02	1882.....	9.35
1886.....	6.23	1881.....	9.70
1885.....	6.52	1880.....	9.80
1884.....	6.75	1879.....	8.81

While, as shown, our consumption has increased rapidly, our own Southern States have also turned out much larger amounts; thus the production during the crop year of 1887 to 1888 was 167,814 tons, as compared with 85,394 tons the previous year, Louisiana alone contributing thereto respectively 157,971 and 80,850 tons. At the same time the Pacific coast of the United States received from the Sandwich Islands alone last year 213,696,000 pounds, against 203,400,715 in 1887. Sugar made from molasses on the Atlantic Coast amounted last year to 58,840 tons, against 60,274 in 1887. Some progress is also being made in developing the beet-sugar industry in California. Furthermore, cultivation is being pushed in Nebraska, although no sugar factory has been as yet erected in that locality. The soil has been found to be well adapted to beet cultivation, which, in connection with the favorable climate, has encouraged a number of German farmers who have settled there to undertake the production of a crop, with the cultivation of which they had obtained experience in Germany. The results thus far have been encouraging, and a specimen of beet sent last autumn to the Bureau of Agriculture, in Washington, for analysis showed so high a saccharine value that capital has already been secured for the erection of a factory.

The weather is reported fine in Cuba, and receipts are increasing, but the disposition of holders is to delay sales for improved prices. There are no offerings yet from the British West Indies, although the crop season has begun. Advices from Brazil speak of the small quantity that is available, and the crop is now estimated to show a deficiency of 90,000 tons, compared with that of last year, hence the above estimate of 250,000 tons for Brazil

may have to be reduced to 190,000. Meanwhile the statistical position of sugar remains favorable, the visible supply in Europe and America, including Cuba, on February 1 being only 1,099,545 tons, as compared with 1,285,199 tons on February 1, 1888, and 1,499,486 tons on February 1, 1887. The present price of fair refining Cuba in New York is 4½ cents. The lowest price for the same we have had during the past four years has been 4½ cents, and the highest 5½ cents. This shows that under the circumstances raw sugar is remarkably cheap just now, and that there is plenty of room for improvement between now and midsummer, should consumption in this country make as good headway till then as has been the case last year.

Percy C. Gilchrist, one of the inventors of the basic process, has lately sent out his usual report, showing the quantity of basic steel made in different countries. In former years Mr. Gilchrist followed the rather awkward system of reporting for the year ending October 31. He has now, fortunately, adopted the calendar year. In the table given below the figures under 1887 are for 12 months, ending October 31, 1887. For 1888 the calendar year is reported.

The Make of Basic Steel.

Producing Countries.	1887.		1888.	
	Total Tons.	With under 17 per cent. carbon. Tons.	Total Tons.	With under 17 per cent. carbon. Tons.
England.....	364,526	238,358	408,594	276,476
Germany, Luxembourg and Austria.....	1,102,496	826,600	1,276,070	1,026,038
France.....	176,500	123,049	222,333	158,223
Belgium and other countries.....	60,950	39,716	46,237	32,300
Totals.....	1,704,481	1,222,732	1,963,234	1,493,032

It will be noted that mild steel continues to be the product which predominates, and that Germany holds its rank as the leading producer of basic metal. In our own country the only concerns which have lately made basic steel are Carnegie, Phipps & Co., at Homestead; the Otis Iron and Steel Company, at Cleveland, and the Pottstown Iron Company—the former two using the open-hearth and the latter the Bessemer converter. In his report Mr. Gilchrist makes the significant statement that about 600,000 tons of slag, containing about 36 per cent. of phosphate of lime, was produced with the steel, most of which was used as a fertilizer.

The architectural iron works at Chicago suffered last year from a decided curtailment of business. This year they are likely to be overrun with orders, if the present outlook is realized. Architects' offices are full of plans of buildings, projected for the coming season, both in Chicago and at outside points all over the Northwest. Estimates are being submitted by the architectural iron works on a very large part of this business, and much more is expected to follow. In some localities the building season will open very early, and contracts have already been placed for the ironwork. It is to be hoped that labor troubles will not intervene to mar the bright prospects. The agitators are at work, however, endeavor-

ing to create dissensions and to foment disturbances, and if they do not succeed it will be on account of the conservatism of the rank and file of the workmen, who are not now so easily influenced as formerly by self-constituted leaders.

CORRESPONDENCE.

Fuel Economy of Heating Furnaces.

To the Editor:—Referring to the discussion in a recent number of your paper on economy of heating furnaces, the writer begs leave to call attention to the performance of a gas furnace designed to give economy on a small as well as on a large output. It has radical changes in construction from the ordinary Siemens or regenerative type, a description of which will be given your readers as soon as the Patent Office has passed fully on their patentability. The furnace referred to has heated frequently as little as 8 tons per single turn, of small and particular shapes of iron for an 8-inch train, without affecting the consumption of coal per ton, it not being charged with metal more than half the time. It has heated ½ ton of ore and 1½-inch iron billets from cold to a wash heat in 8 to 12 minutes. It has been fired from a black heat after standing idle one turn and heated ready for the rolls, a good heat of iron, in 1 hour from the time gas was first generated and turned into the furnace, the gas generator having also been idle and at a black heat. The coal consumption always included nights and Sundays, the furnace usually working four or five nights per week. I quote from a letter from the New Haven Rolling Mill Company, New Haven, Conn., who are using the furnace: "Referring to your gas producers, while running your furnace for about 12 months, we would say: We heated iron for the rolls with an average on one or more weeks' run of 250 to 300 pounds coal per ton."

Owing to the writer being confined in the West on other work during repairs, the furnace has since been rebuilt on the Siemens plan, with the result that the coal consumption on the same work has increased to about the highest figures given by your correspondents for gas furnaces, thus showing that there is still hope of improvement in this class of furnace. It is only fair to say that this furnace was isolated from others of its class, and was largely attended by workmen having no previous experience with gas furnaces. The mason work had no repairs during this time, but, owing to a defect in the draft connections and to errors in burning out, cleaning, &c., some work was necessary on flues and valves. The gas generator was operated at one time 11 double turns without removing ashes, owing to lack of care on part of workmen.

C. M. RYDER.

Findlay, Ohio, February 12, 1889.

Mr. Edward Cabbie, an old and respected resident of Brooklyn, died at his residence, 108 Skillman avenue, February 15, in the sixty-sixth year of his age. Mr. Cabbie was born in Frome, Somersetshire, England. His family there were large manufacturers of wire. Upon arriving in this country 40 years ago he came to Brooklyn, and, in connection with his brothers, he followed the pursuit of his ancestors, and until three years ago was general superintendent of the William Cabbie Excelsior Wire Mfg. Company, in which he was also a stockholder and director. Failing health compelled him to give up entire business connections, and upon the advice of his physicians he visited his native land. The trip, however, did not seem to aid him. Losses in his family undoubtedly preyed upon his mind and hastened his end.

The Mining Engineers.

The opening session of the fifty-third meeting of the American Institute of Mining Engineers was held on Tuesday evening, February 19, at Hardman Hall, Nineteenth street and Fifth avenue, New York, Andrew Carnegie being in the chair. In the absence of Mayor Grant, who had promised to welcome the engineers to New York, Mr. Carnegie spoke the words of welcome. President Wm. B. Potter, of the Washington University, St. Louis, responded on behalf of the institute, and read a paper reviewing the past year's work and the progress of the institute from the time of its organization at Wilkesbarre, Pa., more than 18 years ago, by 22 gentlemen then prominently identified with the iron, steel and kindred trades, until its present state of prosperity and usefulness. There are now on the rolls 1800 names. Professor Potter questioned whether the institute, with this enormous membership, would not become unwieldy, and whether its three meetings held each year in different parts of the country were not becoming more and more given up to excursions and the amusement of its members rather than the serious transaction of business relating directly to the institute and its objects. He urged the grouping of the various interests of the institute, and as a suggestion for such a grouping segregated iron and steel, the precious and base metals, geology and mining, and chemistry. Such a classification, he urged, was simple and natural and would not conflict territorially. Professor Potter also emphasized the importance of presentation at the meetings of more complete and clearer papers, referring to the majority of the papers as now read before the institute as lacking in detail, and in some cases as being not only unreliable, but often misleading.

Secretary Raymond then read a biographical notice of the late Erich C. Schaufuss, contributed by J. H. Bowden, of Wilkesbarre, Pa. Mr. Schaufuss was a member of the institute, and lost his life in a gas explosion in the mine. The circumstances surrounding this accident were of a peculiar nature, and called forth an opinion by Professor Raymond, who cited his own experience in the mine, and spoke at some length on a subject in which his listeners were deeply interested. Dr. Raymond paid a touching tribute to the memory of the deceased engineer, and gave it as his opinion that when the gas ignited Mr. Schaufuss threw himself face downward on the ground to allow the flame to pass over him, and, his clothing catching on fire, thought the flame was still passing over him, lay too long, or, in the confusion of the moment, rushed the wrong way, and was overcome by the after-damp. The explosion was caused by a naked lamp carried on the hat of a miner, who, absurd as the case may seem, was carefully guarding a safety lamp carried in his hand. Dr. Raymond then spoke on "End-Lines and Side-Lines in the Mining Law," using the blackboard to illustrate the subject. He was closely followed by his audience, and his ready and brilliant oratory and graphic illustrations brought out hearty applause at the close. The meeting then adjourned, to meet in the morning, to visit the Edison Laboratory, at Llewellyn Park, N. J., and the Spiral Weld Tube Works, near Newark.

The New York Phonograph Company has received a certificate of incorporation. The capital is \$1,250,000, and the trustees are John P. Haines, of Tom's River, N. J., John D. Cheever, Richard Townley Haines, Noah Davis, William Fahnestock, W. Seward Webb and John L. Martin, of New York City.

Pig Iron Warrants.

OPINIONS OF THE TRADE.

We have received from a few furnace companies letters which reflect the views held by producers, which we present below, a prominent manager in Eastern Pennsylvania writing:

We are not favorably disposed toward the proposed Pig Iron Warrant system. We believe it will result injuriously to producers of pig iron, particularly to those that own their plants and do business chiefly on their own capital. Supply and demand regulate the prices of pig iron, irrespective of individual costs. When the supply exceeds the demand prices fall and reach a level without regard to the average cost, until the losses incurred compel the blowing out of sufficient furnaces to restore the equilibrium. The stoppage of furnaces not only paves the way for an ultimate advance in selling price, but from reduced demand also lessens the cost of raw material. Those furnaces that by location or superior management are able to continue in blast are thus enabled to tide over the period of extremely low prices, preventing too great a curtailment of production and the possibility of an iron famine. The quicker the readjustment between production and consumption is attained the sooner will prices be brought to a fairly remunerative basis. With the present large producing capacity of the country, and the ease with which production may be quickly increased, as shown within the last few months, there is not much danger of prices advancing unduly high from any lack of iron to meet all legitimate demands, unless speculators enter the market and by large purchases compete with consumers and temporarily withdraw large blocks of iron from consumption. By rapidly advancing the price of iron, and with it the cost of production, speculators have always proved injurious to the best interests of the producers. When the reaction comes, iron falls in price much more rapidly than the cost of making can be reduced, and the average result of the "boom" is a loss to the manufacturer. There is an increasing disposition on the part of conservative furnaces to sell their product only to consumers, especially when there is a brisk inquiry.

The warrant storage system, we believe, will encourage speculators to gamble in pig iron by affording increased facilities, and will thus introduce a more or less permanent disturbing influence in the trade. Besides, this system will offer inducements to continue the production of iron when it is not needed, by enabling financially weak concerns and those not economically managed to continue producing when under natural conditions they would be forced out of blast. Such is the general publicity given to the pig iron business, the mere fact that furnaces are producing in excess of the wants of the country is sufficient to weaken prices, even if the iron made is not thrown on the market. We would thus suffer from low prices, and obtain no corresponding reduction in cost from lessened demand for raw material. The blowing out of numerous furnaces assures the buyer that bottom prices are about reached and encourages buying. The storage system, we believe, would be injurious in two ways—lowering prices by encouraging unhealthy and unnatural competition and by increasing the cost of manufacturing. The conditions under which pig iron is made are so various and the circumstances influencing cost so diverse, that any combination to control and adjust the differences is not likely to meet with any enduring success.

We are of the opinion that all interested in the business will ultimately be better off by allowing the laws of supply and demand to regulate the trade without any artificial restrictions.

The efforts of the Philadelphia and Reading Railroad Company, following the panic of 1878, to relieve the furnaces in their territory by purchasing and piling their excess product, resulted injuriously to all concerned. The furnaces, encouraged to continue in blast much longer than the conditions of the trade warranted, lost heavily in consequence, and the railroad company did not escape. For several years after the purchases ceased the furnaces were compelled to compete with their own brands, offered for sale by the railroad company. These large stocks were a constant menace to the trade. Buyers continually made use of them as an argument to weaken prices, and it was quite a relief to all concerned when it was known that these stocks had finally been disposed of. The local aspect of affairs improved almost immediately. If this was the result of a storage system on a small scale and confined to a limited section, what will be the result if a new one on a large scale is extended over the whole country?

From Virginia comes the following:

The plan of the warrant company strikes me as being unfavorable to iron-makers in general, and, therefore, to us. It presents itself to me thus: The changes in the market are no longer to be effected by supply and demand, but are to be placed in the uncertainties of speculation. The statement that the extremes heretofore experienced shall be obviated seems possible, but not if the warrants are made "a medium for speculation." What control can the company then have? The stock of iron is in warrants, which are in the hands of speculators; trade is brightening and they will not sell; furnaces have no stock and advance prices, but before they reap any benefit speculators unload, prices decline and makers can again begin to store their iron on warrants, furnacesmen always getting low prices and speculators the benefit of the advance. We the buzzard and they the turkey, all the time. To talk about making matters better for us by putting prices in the hands of stock gamblers does not seem to me to rise to the dignity of second-class nonsense.

A large concern in the Shenango Valley writes:

I believe that any organization the object or final result of which will be to make the pig-iron product of this country the subject of exchange board speculation and gambling will be an unmitigated evil to the pig-iron manufacturers, except so far as it may furnish convenient certificates of storage, which can be used as collateral for necessary loans. This purpose can be accomplished equally as well, or better, by the organization of responsible storage companies in the different centers of manufacture, as has already been done in Pittsburgh and Cleveland, and possibly at other points.

A producer in Jackson County, Ohio, writes:

My opinion is "the creation of pig iron warrants as a medium for speculation" will unfavorably affect the interests of the legitimate maker of pig iron. Under the arrangement proposed production will go on regardless of consumption until stocks become abnormally large, and the surplus metal in the warehouses will stand a perpetual menace to our business. The further we are removed from speculators and speculative tendencies the better. I speak from the standpoint, of course, of a *bona fide* pig-iron maker, and not from that of the boomer, the speculator or the money

lender, in whose interest this scheme is launched. It will be a sorry day for the producer and laborer of this country when we have in sight one or two years' supply of pig iron, as ingeniously advocated in 'the argument.'

From a large charcoal iron works in Michigan comes the following: "We would be in favor of the plan, as it seems that it would work beneficially to the trade. Pig iron warrants in Scotland and England are transferable and good as any bank paper, bills of lading or cash."

Another large producer in Michigan writes:

I suppose the apparent necessity for the proposed syndicate comes from the fact that there is an overproduction of metal, and that some concerns must have ready money for their output even though the market should be found below what it ought to be. The remedy proposed is to relieve this class of manufacturers by giving them what they want without a corresponding injury to the market. If my premises are correct, it is an open question with me whether the proposed plan would not in the end do more harm than good. If too much iron is being manufactured, those who ought not to be in the business must retire from it, and the sooner they do this the better it will be for those who are so situated, both as to location and capital, as to entitle them to stay in. The plan proposed will increase rather than diminish the output, and keep on their feet—for a time at least—those who should not have ventured in, or who being in would otherwise go out of business. Again, I presume that if enough of the furnaces were provided for in the manner proposed a false market would be the result, and, generally speaking, it seems to me better that the laws of trade should be left to solve the difficulties in question without what, to me, seems a false support. Inasmuch as this company would not have occasion to deal with the proposed syndicate, I believe that the creation of one, if successful, would unfavorably affect our interests. When I say "our interests," I mean the interests of all furnaces so favorably situated as to make a fair profit at the present price of pig iron.

Probably the point which it would be most difficult to determine is

The Attitude of Consumers.

With the exception of the large rolling mills, the cast-iron pipe works, the greatest stove concerns and manufacturers of architectural castings and hardware, the great majority of consumers melt only relatively small quantities of pig iron. To them the cost of raw material is not so absorbing a subject of consideration that they have given much thought to the questions which might affect the trade. Among

THE ROLLING MILLS,

we turn, first, to those of Pittsburgh. A maker of high grades of rolled iron writes:

We have an institution here called the Union Storage Company, which is very prosperous and we imagine does a similar business to the one proposed in your article, as they issue bankable certificates. We doubt if the institution proposed is not an incroachment on the field of legitimate operations of the consumer and manufacturer, and contrary to the natural laws of trade. They may give a field for the man who wants to speculate on margins, but we think that they do not help a properly managed manufacturing business.

A large firm of steel makers state:

We do not see that the introduction of pig-iron warrants as a speculative medium

could have any beneficial result on our business, or in fact on any legitimate business. The less speculation there is in the standard products of the country, the better the business interests will be served, and the less the rights of the public will be interfered with, in our judgment. We do not hesitate to say that storage companies who issue certificates for iron deposited with them are a benefit to people who handle pig iron, and when it is confined to the legitimate business transactions in that commodity no harm can come to trade, but when it is used for speculative purposes we regard it as unnecessary and dangerous.

One of the great manufacturers of Pittsburgh says:

Distances in this country are so great that it is difficult to make a comparison with Great Britain in the storage warrant matter. I am glad to see the experiment tried and am inclined to think it would be a success. It should have the effect of keeping values of pig iron uniform and prevent the wild fluctuations we have been accustomed to, and which do the trade immense harm. Of a great staple like pig iron there should be a greater stock than we have been carrying.

A rolling mill in Eastern Pennsylvania, which occupies a leading position in the trade, sends the following communication:

As a consumer of pig iron, I am of the opinion that the natural effect of the warrant system as proposed by the American Pig Iron Storage Warrant Company will be, for a time, to corner the market and thus advance the selling price; but later to give us a low range of values in that material. It will, of course, be used mainly by the weaker concerns, who have not sufficient capital of their own to carry heavy stocks. The warrant company can only be made a success by securing large accumulations of pig iron stored in different portions of the country. Experience has taught us that large stocks, even when held by the strongest concerns, are a constant weight upon and menace to the market, and inevitably result in lower prices.

A large mill in Eastern Pennsylvania, producing plates and nails, takes the following view of the matter:

We consider any sort of a speculation injurious to business, and it is a matter of hesitation as to whether or not the parties at the bottom of this scheme would not be disposed to use it for speculative purposes. If the effect would be the equalization of the extreme rise and fall of prices we would have no doubt it would be a benefit to general business.

A plate maker in Pennsylvania sends us the following:

We believe that the American Pig Iron Storage Warrant Company, if conducted according to the plans outlined in your issue of the 31st ult., would prove a very good thing to the iron trade generally and to the country at large. Our principal reason for this opinion is the firm belief that a company of this kind would prove a most effectual factor in preventing the great fluctuations in the price of pig iron which are so serious and disastrous to trade.

From the Mahoning Valley we have the following:

Replying to your circular letter of the 1st inst., we do not believe that any medium of speculation would favorably affect the interests of legitimate manufacturers. We do think that a storage company, well organized, and whose charges would be low (for cost of storage at furnaces would be nominal), would be a general benefit to the trade in lessening the

fluctuations of the market by carrying sufficient stock to meet the wants of manufacturers for three to six months ahead.

•The owners of another Pittsburgh rolling mill write:

We cannot see that any benefits are to be derived either to the producer or consumer of pig iron by passing through a middleman or storage company. In our opinion the nearer you can bring the producer of pig iron and the consumer of pig iron together the better for both.

A large consumer of mill iron in Ohio puts himself on record as follows:

I think the creation of a warrant system will promote the accumulation of large stocks of iron, which would be an injury to the legitimate pig-iron producers. The furnace capacity of this country is quite large enough to supply all probable demands for pig iron on short notice and at reasonable prices, without accumulating a large reserve. Furnaces that cannot sell their product at remunerative prices and have not got the capital to enable them to hold their iron had better bank-up.

The manager of another Ohio rolling mill tersely says: Let it come, as it is bound to do before long. Those who desire can use it for financial help, others need not. Time and trial will test its merits.

A concern in New York producing bars and structural iron writes: "We do not think well of the proposed Iron Storage Warrant Company. We believe that it will bring a speculative element into the business which cannot be beneficial. In times of depression in the trade, as it now exists, small concerns, with limited capital, go out of blast, and remain out until trade revives. The new system, as we understand it, would furnish means for these concerns to go on, at a loss to themselves primarily, and aid in continuing the depression, and work injury to the trade generally."

A nail-maker on the Susquehanna states: "We think it will be prejudicial, as it will lead to greater extremes in prices and less stability, as it aids to production on an overstocked market when a diminished production would have a more wholesome effect. It further increases the cost to the producer, plus the charges, and stimulates speculation, for which the warrants would furnish a convenient method. Believing a steady remunerative market the most conducive to the interests of the consumer, as well as producer, we think its adoption a positive evil."

A rolling mill in Ohio sends the following communication: "We have read the plan proposed by Mr. Hull, for the establishment of an American Pig Iron Storage Warrant Company, and readily fall in with the idea. We think that the objections raised to the warrant system by some are more than offset by the many advantages that attend it. We fully indorse the sentiments expressed by the projectors of the plan and hope to see the company on a good sound footing."

Among the largest consumers of pig iron as founders are

THE CAST-IRON PIPE MAKERS.

Among them P. D. Warmer, Chairman of the Mellet Foundry and Machine Company, of Reading, Pa., sends us the following communication:

We are in sympathy with the movement, under the belief that it would estab-

lish a more steady value in pig iron and prevent sudden and unnatural fluctuations in prices. It would also have a tendency to increase or diminish the production in proportion as the quantities in the storage-yards would be increased or decreased from time to time. In short, we think it would bring about a safer condition of things in our trade, as in all others using pig iron in considerable quantities, and also prevent that reckless competition among furnacemen and prove the necessity to other manufacturers of having their business regulated in some such way with their competitors to save themselves from ruin during such times as the present. This, however, has latterly been getting to be pretty well understood by people who have sense enough to get out of the rain. The more people talk against trusts and combinations of either labor or capital the more there will be of them, and the stronger they will become, but when let alone they will work out the best possible results—ultimately for the country at large.

Another large pipe-maker writes us:

"Our impression is that it will be a good thing for both producer and consumer, as it will have the effect of lessening the fluctuation in prices."

A large purchaser of pig iron writes:

In our judgment the key of success in such a movement depends upon the uniformity of quality which the storage company can guarantee for the iron which is covered by their warrants. In saying quality we do not mean grading, but the character of the metal, its constituents and impurities. If they can overcome this difficulty in addition to those that are more simple consumers of iron can become purchasers, but without some such guarantee we do not see how the warrants can become merchantable articles, although they may answer the purpose of speculators. We fear that the fluctuations of the value of pig iron will not permit the annual cost of carriage which we understand has been adopted by the storage company. This, however, is a matter which only affects those who speculate in the warrants. The effect of a large block of metal being in part covered by warrants, and which can be added to or taken from according to the demands of trade, is theoretically good upon the market. To what extent it will be possible for the storage company to overcome the obstacles which surround it time alone can tell, but the removal of the two which we have pointed out we think is essential for its success.

The president of a large Western pipe foundry says: "We cannot see how the consumer can be benefited in the least, but, on the contrary, it will work to his detriment. We cannot help but think that many of the furnacemen will have a desire and disposition to work in harmony with those who actually use their product, rather than with those who use their warrants only for speculative purposes. We suppose that that was the main purpose aimed at in the organization of the warrant company. To err is human, and we may be wrong in our impressions, but we doubt it."

To producers of pig iron, one of the most important classes of customers are

THE STOVE MANUFACTURERS,

from some of whom we have the following letters, the first being from one of the largest and most progressive firms in the trade:

I have good reasons to believe that this subject is not thoroughly understood by those whom it might seem would be in-

terested, and, for proof of this, would say that during the past few days I have had the question asked me by different well-informed gentlemen as to what effect this would have upon the price of pig iron. My answer was, "I cannot see that it will have any effect," and when I came to talk with these parties, and I must admit that I was not thoroughly posted myself, I found that such was the case with those who asked the question. So I undertook to get informed myself, and I find that this is simply a company formed for the following purpose—viz., to grade and weigh the production of any furnace and give a warranty as to the number of tons and the grading of any iron that may be piled up in the yards of the furnace. They give a written warranty to the owner or manager of said furnace, charging for their services 25 cents per ton for the first month, and 2 cents per ton for additional months so long as the iron may remain unsold. A capitalist, or any one having money to invest, makes inquiries about a certain lot of iron, and finds that this warranty held by the furnace gives him the information of the number of tons and the grade, so that he feels safe in investing. After the investment is made if the iron falls below the grade or the tonnage falls short the storage company holds itself responsible. The new company is formed as near like the Pig Iron Storage Warranty Company in Scotland as possible. Now, I fail to see how this is to affect the price of pig iron. It may be that through the formation of this company, which is similar to others that have been previously formed and are in existence, a larger amount of iron may be in store at the close of any year than heretofore, but through the medium of this company it may become somewhat speculative. Parties looking for investments will think that they can make a purchase of these warranty receipts, which are held with more safety. Beyond this I cannot see a point where the pig iron business proper is to receive any real benefits. It may enable pig iron manufacturers to obtain loans much easier by having a certain tonnage of pig iron in their yards, surrounded by a fence, if you please, with a lock and key on the gate, than under former plans.

An Eastern concern writes:

The American craze seems to be for speculation. We are not speculators, and we feel little interest in the proposed scheme for a pig iron storage warranty company. Neither do we quite see how such a scheme can become very successful. If all pig iron were of one quality there would be no difficulty, but with two or three grades from every furnace, and about as many qualities as there are furnaces, there will, we think, be many difficulties to surmount in perfecting the scheme. As to prices, we doubt if they will be affected much either way through what speculation may be done in this line.

A Troy stove-maker sends the following communication:

I am opposed to the plans of the American Pig Iron Storage Warranty Company. I believe that speculation in pig iron by the general public would be injurious both to the producer and consumer, because, although they might be benefited incidentally, its usual tendency would be to increase the cause of abnormal fluctuations in the demand for pig iron, which would be a menace to legitimate trade and a benefit to professional speculators. It has been truly said that pig iron is a delicate barometer for indicating the condition of trade; and the reason is its susceptibility to the influences which regulate trade. Abnormal conditions of trade are made more intense by speculation and the reaction from speculation, and, consequently, a commodity so susceptible and important

as pig iron should be kept as free as possible from its influence.

A large works in the same center write:

It is our opinion that a pig iron storage warrant company would be a valuable adjunct to the manufacturers, dealers and consumers of pig iron, for the reason that it would tend to steady the values of such products in the general markets of the country. We have given no consideration to the speculative value of such a movement, and cannot judge of the effect of any warrants they might issue, excepting that through their medium we should be able to determine prospective values more readily than at present.

One of the most thoughtful of Pennsylvania makers sends the following:

We cannot look upon the contemplated scheme with satisfaction, preferring as we do competition to sumptuary control, and while admitting that competition is attended with evils, yet we are impressed with the idea that centralization will gravitate to greater. We cannot help feeling that such methods of consolidation and restriction are primarily inconsistent with our free institutions and independent individual effort, and will eventuate into selfish and unnatural conditions.

From Michigan comes the following:

We are not purchasers or consumers of pig iron, but buy large quantities of iron castings and tubing. Anything that would cause sudden or marked fluctuations in the price of the crude article would necessarily stand in the way of our making as favorable contracts for our yearly supply as we are able to do in the present condition of the market. We should therefore deplore the introduction of pig iron warrants as a speculative medium.

Western Commission Merchants.

From Pittsburgh we have the following: "I think that the effect of the general introduction of that plan would be adverse to the interests of the commission merchants generally, and would probably drive many of them out of the business, as there would be less need for their advancements, and the warrants could probably be handled by brokers who at present have nothing to do with pig iron."

A second Pittsburgh firm writes: "We have a local organization somewhat of the nature of the storage company, which is prominent and competent, and as we take it the idea of this company you mention is to simply make a national company to do what the local companies are now doing. We do not know of any particular benefit to be derived from the organization of this company you mention, as our local company—namely, the Union Storage Company—is now doing, as far as we know, just what this company you mention would be supposed to do."

A Cleveland firm writes:

If the plans of the American Pig Iron Storage Warranty Company are carried to completion they will, no doubt, be taken advantage of largely by the makers of Southern pig iron. This being the case, it seems natural to suppose that the business of the commission men handling the product of that region will be diminished, owing to the fact that the storage company will enable the furnaces to raise money without putting their metal into the hands of commission men to be sold at any possible price. The storage company will be able to do what the commission man does now, i. e., be able to raise money. The introduction of the warrants as a speculative medium may possibly open to the commission man a new line of

customers others than the legitimate users of pig iron, thus in a measure helping him out of the loss of business occasioned by the storage company entering the field. This last feature, however, will take time to become popular, it strikes us.

A Louisville house says:

The names of the gentlemen connected with the scheme of the American Storage Warrant Company are certainly all those of good, substantial men. The organization seems to be a good thing for the producers of iron who find it necessary to place their iron in storage at their furnaces for the purpose of having warehouse receipts issued to them for the purpose of raising money on the same. This privilege has already been in force for several years past by storage-yards being established at several of the leading markets in the West and South, where they could place their iron in storage and receive warehouse receipts on the same, at a less cost to them than the American Pig Iron Storage Warrant Company offers. I hardly think it will have much effect, if any, on the commission merchants of this section, as I do not believe that any of them will want to speculate in the warrants. However, this may be done in the East—in Wall street. As to its being a success, that depends largely upon the company being able to control the output of all of the furnaces, and how this can be done I cannot say, as the territory to be covered is so large and the interest so great, and there are so many furnaces who do not want their iron tied up with warrants, much preferring to keep it free.

A Detroit firm reports:

We do not think that the successful introduction of pig-iron warrants as a speculative medium would affect commission merchants, for the reason that if a surplus is to be accumulated with no prospect of any material advance in price, the furnaces that sold their iron as made would make more money, and the ones that employed agents would be more likely to dispose of their iron, and others that did not would accumulate the surplus, and in the mean time would be paying interest, thus increasing the cost of their iron far in excess of the amount paid as commission for selling.

A leading Cincinnati firm writes:

We are in favor of anything that will improve the status and prospects of pig iron making in the South. It is quite apparent that something is needed to avoid the extreme fluctuations in prices that result from changing conditions of the market, and from the need of large producing companies to realize promptly on their product, whether the market is favorable or not. It looks as if a storage or warrant system in which the companies would freely join would act as a regulator. It should enable makers to carry their iron in times of depression without concentrating their capital on their iron yard, and in times of high prices it will enable them to get the benefit of the market. At the same time, there are some features that render any large success of the scheme problematical, in our judgment. One is that even under the most favorable conditions the storing and carrying of pig iron is attended with considerable expense. It must necessarily be handled twice. Storage charges must be paid, if the metal is properly looked after. Interest is no small item. Taking these things into account, it is clear that iron must be sold at an advance of nearly \$2 per ton to warrant a producer in putting it into storage and holding it for a year. We think it will prove that most makers will prefer, when they have an accumulation, to close it out at any price that will not involve actual loss rather than speculate on an advance of \$2 per ton.

Another possible difficulty is that the market is not yet quite ready, especially in the West, to do away with the identity of special brands and buy Alabama or Tennessee iron on warrant, without knowing what brand is to be obtained. While Southern makes are similar in character, there is unquestionably a decided difference in quality, carefulness of grading and uniformity. The warrant system would enable furnaces making inferior iron to unload it on the market on equal footing with those making the best iron. This would place the latter at a disadvantage that they would not be apt to submit to long. The natural effect would be that prices for storage iron sold without brand named would have to run about 50 cents below the market for standard irons. As stated at the outset, the workings of the plan will be at first experimental, and it may prove that as its operations come to be better understood these objections will disappear. All, in our judgment, will depend on the thorough care and conservatism of its management down to the smallest details, and on the spirit in which the leading furnace companies enter into it.

One of the great Chicago firms briefly puts the matter thus: "We consider the plan perfectly practical, and it should be profitable to the stockholders, if well managed, and also of benefit to the entire iron trade. The only question in our mind is as to whether one large company is better than local companies for each prominent point."

From a Warehouse Company

long established we have the following:

The negotiable character of the warrants which the American Pig Iron Storage Warrant Company propose to issue will doubtless induce many furnacemen to consider favorably the establishment of a storage yard on their premises, under the charge of this enterprising company. Where the producer needs facilities for disposing of his pig iron promptly at ruling market prices the warrant system will doubtless enable him to realize quickly. This will throw the burden of carrying on a speculative public, who hope to market the iron at the advanced price which the producer, through lack of capital, perhaps, has to forego. A feature of the warrant company, however, which is spoken of as one of its chief recommendations is by no means new. We refer to the facility which is offered producers for borrowing money on their iron to carry it over a depression, or to avail themselves of capital otherwise tied up by future sales. The Philadelphia Warehouse Company, it appears, has been practically doing this business for many years in a quiet way. This company leases ground at the furnace on a nominal rental and has iron stored thereon. Instead of issuing warehouse receipts or warrants and charging storage on the iron thus deposited, they loan the money or credits themselves to the furnace companies, without making charge for storage. By this method a considerable saving is made by the borrower, who only has to pay a moderate commission in addition to the interest the bank or lender would charge him for negotiating his warrant. The capital of this company is \$1,000,000, full paid, with a good surplus, so that, though able to do a large business, they cannot supply the needs of all the many borrowers having this class of collateral; and there will be, no doubt, room for a new, energetic and well-equipped concern such as the American Pig Iron Storage Warrant Company.

An improved system of rapid transit for New York City would cost, it is estimated, about \$30,000,000.

Washington News.

(From Our Regular Correspondent.)

WASHINGTON, D. C., February 19, 1889.

The parliamentary prospects of the Committee on Ways and Means for the purpose of circumventing the tactics of the tobacco tax repeal leaders have collapsed. The effort to get signatures to a call for a caucus last night developed the fact that Chairman Mills could not secure the majority, so as to have control of the situation. He and his friends, therefore, regarded it as the part of prudence not to attempt to force the fight.

There are now four propositions before the House, three of them from the Committee on Ways and Means.

1. The Mills resolution of unconstitutionality of the Senate substitute, which is simply a subterfuge, as the Senate has never claimed the right to originate revenue legislation, but has the constitutional power to amend. This was established by the fact that the existing tariff of 1883 was a conference measure based upon a House bill and a Senate substitute.

2. The McMullin tariff bill in the line of the Mills bill. In his report from the Committee on Ways and Means Mr. McMullin begins with an attack upon the Senate committee, some of the provisions of which are characterized as entirely inexcusable. The report says that the committee, being unable to agree to any tariff bill which gives no relief to the people, but which increased these burdens, have prepared the accompanying bill, and tender it in the hope that it may be accepted and adopted. While it does not make all of the reductions that the present condition of the Treasury and the best interests of the people demand, it is tendered in a spirit of compromise. Figures are given to show that the bill would reduce the revenues by \$72,133,029. The remainder of the report is made up of an argument in favor of tariff reduction based upon an array of figures showing the value of agricultural products at different periods.

3. The compromise scheme of Breckinridge, embodying all the provisions of the Randall tobacco tax repeal bill. It puts tin plate and wool on the free list, and proposes a woolen schedule by which the rates are reduced correspondingly, and it remedies the present unequal provisions as to woolen and worsted fabrics. It removes the tax on tobacco, and includes the provisions of the bill adopted by the House (the Mills bill) as to tobacco.

4. The Cowles bill with the Randall substitute, repealing all of the tobacco taxes. In their report the majority of the Committee on Appropriations explain that sections 1 and 2 repeal all internal taxes after June 30, 1889, on cigars, cheroots and cigarettes, snuff, manufactured tobacco, the special taxes on manufacturers of tobacco, dealers in leaf tobacco and on peddlers of tobacco. The amount of revenue received from these sources during the fiscal year ended June 30, 1888, was \$30,662,481. The enactment of the bill would reduce the estimated surplus for the fiscal year 1890 from \$53,432,511 to \$22,745,165, a result—whether viewed from the standpoint of an excessive revenue or as a relief from unnecessary taxation upon the people—most desirable. The committee believes that the bill furnishes a practical and simple means of reducing the surplus revenue, as it is evidently impossible, at this late day of the present Congress, to pass any bill involving a complete revision of our whole revenue system. The minority report, presented by Mr. Forney, is confined to a simple recommendation looking to the passage of a substitute bill made up of the sections of the original Cowles bill, repealing the taxes on chewing and smok-

ing tobacco and snuff, all special taxes on manufacturers and dealers, and all taxes on dealers in leaf tobacco; and fixing at \$3 and \$1 the annual tax on cigar manufacturers and dealers in tobacco respectively.

The effect on the revenue under the House bill and the Senate amendments, as shown by the Treasury Department figures, is House bill reductions: Customs, \$50,350,345; internal revenue, \$17,616,234; total, \$67,966,579. Senate substitute: Customs, \$13,976,887; internal revenue, \$33,905,780; total, \$47,882,667. Average ad valorem rates: Existing law, 46.91; House bill, 42.38; Senate substitute, 46 per cent. The effect on metal duties would be: Collected 1887, \$22,524,007; estimated House bill, \$14,991,704; estimated Senate bill, \$30,585,569.

With these conflicting interests in view the prospects of concurrent action are very problematical. The attitude of the Committee on Ways and Means seems to be inspired largely by a personal opposition to Mr. Randall. The latter gentleman, in the meantime, is backed by fully 70 of the Democrats of the House on the internal revenue repeal question. The Republicans are holding aloof, and will not co-operate in the House, although all their members on Appropriations voted with Randall to report the Cowles bill and substitute. The Republicans, anticipating an extra session, prefer to dispose of this matter in their own way.

STEEL INSPECTIONS.

The conference of naval officers, steel manufacturers and shipbuilders in regard to simplification of methods of steel inspections has resulted in a better understanding of the three interests involved in the turning out of ships of war, but will not result in any very material change in the method of conducting the tests of steel. The report of the three officers, Naval Constructor, Engineer-in-Chief and President of the Board of Steel Inspection, has been prepared. It is understood that no very material changes have been recommended. The transportation of material for testing to certain points, and, if unsatisfactory, its return involves expense and delay. A plan is proposed which will divide the labor of tests between the manufacturer and the officer of the Government, which will obviate the necessity of the present large force on that duty. The final tests will be made by the Government, but the heats will be watched by the manufacturers.

THE CAST-STEEL GUN.

The successful statutory test of the open-hearth cast-steel gun, cast by the Standard Cast Steel Company, of Thurlow, at the Naval Ordnance Proving Grounds, has again raised the hopes of the projectors of cast-steel guns, notwithstanding the forlorn showing of the Pittsburgh gun. The two preliminary and ten Government test charges, 100-pound projectile, fired within 38 minutes were entirely satisfactory as demonstrating the feasibility of the manufacture of such guns to stand rapid and continuous firing. The manufacture of the gun required 13 tons of open-hearth steel. Completed it weighed 13,120 pounds. The walls at the breech are $7\frac{1}{4}$ inches thick and at the muzzle $2\frac{1}{4}$ inches thick; length of gun, 193 $\frac{1}{4}$ inches; tensile strength of the metal, 80,000 pounds; elongation, 21 per cent.; reduction, 19 per cent.; elastic limit, 40,000 pounds. With a charge of 48 $\frac{1}{4}$ pounds of powder a conical shell 100 pounds weight has a muzzle velocity of 2000 feet per second. The Government pays \$5300 for the gun. The ordnance experts are much interested in the work of the first gun, but are not yet willing to admit that the system has any prospect of producing an immediate revolution in gun-making, nor that it will seriously interfere with the built-up guns.

TRADE REPORT.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St. }
PHILADELPHIA, Pa., February 19, 1889. }

Pig Iron.—The market does not show much change, although the general report is of a somewhat favorable character. There is no pressure to effect sales unless at figures pretty near to quoted rates; while the extremely low-priced lots appear to have been unloaded or withdrawn from the market, and are now held for better figures. There is some irregularity, nevertheless, and statements as to actual selling prices do not harmonize as closely as could be desired. Ordinarily good No. 1 Foundry commands about \$18 at tide; No. 2, \$16.50 @ \$17, and Gray Forge, \$15.50 @ \$16. Some very fair brands of the last named are available at \$15.25, and in some cases No. 1 at about \$17.50, but they are what may be called chance lots, and are not offered indiscriminately. Indeed, as a rule, consumers who want their old "stand-by" irons have to pay quoted rates; and while there are what are claimed to be "equally good" qualities at less money, they are not taken with much avidity. To sum up the whole business in a few words, it may be said that the market is working toward uniformity and steadiness in prices, and that supply and demand are in better proportions than they were two or three weeks back. Prospects as regards demand are fairly encouraging, and while there is nothing to indicate any specially heavy movement, an event of that kind should not cause much surprise, as there is undoubtedly a vast amount of work to come on the market sooner or later. Matters are not sufficiently advanced, however, to warrant very confident predictions, although it is a contingency not to be ignored, nevertheless. There is another feature, however, which should be kept in mind, viz., that Pig Iron makers are adjusting themselves to an era of low prices by reducing cost, in the belief that the conditions favor that course, rather than the expectations of a substantial improvement in selling prices.

Foreign Iron.—Bessemer is nominal as last quoted, viz.: \$19.50 @ \$20, c.i.f., duty paid. Spiegeleisen is quoted at from \$28.25 to \$28.50, c.i.f., duty paid, for 20 %, with a sale of 2000 tons at about the inside quotations.

Blooms.—There is a good demand for all grades of Steel, and while prices are somewhat irregular, they are approximately as follows: \$28 @ \$28.50 at mill for Nail Slabs; \$29 @ \$30 for Sheet Iron Billets; \$30 @ \$31 for Soft Tank, and \$35 @ \$36 for Flange purposes; Charcoal Blooms, \$52 @ \$54; Run-out Anthracite, \$42 @ \$44; Scrap Blooms, \$32.50 @ \$34 for "Bloom" ton of 2464 lb.

Muck Bars.—Prices have not been fully maintained, as sales were chiefly at about \$27, delivered. Some of the best makes are held at \$27.50 and upward, but no transactions have been reported at over \$27 since date of our last report.

Bar Iron.—The position has not improved very much up to this writing. Mills in the interior are said to be getting more orders, while local mills are doing fairly on small day-to-day transactions, but there is no improvement in prices. No large lots are being inquired for at present, and while the trade naturally expect a favorable change soon, there are no immediate indications of such a movement. Prices, as we remarked last week, are hardly

quotable. Some mills maintain 1.80¢ @ 1.85¢ as their price for Best Refined Iron, others 1.70¢ @ 1.75¢, with still lower rates mentioned as prevailing at interior points. Skelp Iron is likely to be wanted in large quantities, but there are so many mills waiting for orders that prices are kept at the lowest point yet reached. Last sales in this market were at 1.75¢, delivered, but buyers are holding back, fearing that still lower prices may prevail before things take a good start. Sellers quote 1.75¢, and could not shade that figure without making a loss.

Plate and Tank Iron.—There is no special movement to notice at present. Some of the mills are fairly employed, but they are all open for business at current rates, so that prices do not show much firmness, although they have been crowded to so low a point that it is hardly possible to go further in that direction. The outlook for summer work would be considered very encouraging under ordinary circumstances, but there have been so many delays and so many disappointments that manufacturers prefer the bird in hand, even if it is a poor kind of a one. Prices therefore remain about the same as last week, viz.: 1.90¢ @ 2¢ for Ordinary Plates and Tank Plates, 2.1¢ @ 2.2¢ for Universal Plates; Shell, 2.4¢ @ 2.5¢; Flange, 3.5¢; Fire-Box, 4¢; Steel Plates, Tank and Ship Plate, 2.15¢ @ 2.25¢; Shell, 2.7¢; Flange, 3¢ @ 3½¢; Fire-Box, 3½¢ @ 4½¢.

Structural Iron.—A moderate amount of miscellaneous orders have been received, but nothing of much importance. Bridge-work is likely to be on the market in the course of a week or two to the extent of 8000 or 10,000 tons, while shipbuilders' and architects' requirements are sure to be large; but in the meantime prices are weak and orders sharply competed for. Quotations are ordinarily about as follows: Bridge Plate, 2¢ @ 2.1¢; Angles, 2¢ @ 2.1¢; Tees, 2.4¢ @ 2.6¢; Beams and Channels, 2.8¢ for Iron or Steel.

Sheet Iron.—There is quite a good demand for Thin Sheets, and some of the leading mills are full of orders for this class of material. Thick Sheets are comparatively dull, but prospects are thought to be favorable for the spring trade. Prices about as follows for small lots:

Best Refined, Nos. 26, 27 and 28....	3 @ 3½¢
Best Refined, Nos. 18 to 25....	2½ @ 3 ¢
Common, ½¢ less than the above.	
Best Bloom Sheets, Nos. 26 to 28....	4½ @ 4½¢
Best Bloom Sheets, Nos. 22 to 25....	3½ @ 4 ¢
Best Bloom Sheets, Nos. 16 to 21....	3½ @ 3½¢
Blue Annealed.....	2.6 @ 2.8 ¢
Best Bloom, Galvanized, discount.....	62½ ¢
Common, discount.....	67½ ¢

Steel Rails.—The market is extremely quiet, but there is a growing impression among manufacturers that the business of 1889 will be very much larger than that of the preceding year. Sales to date are about 25 % larger than in 1888, and the increasing number of inquiries betokens a good deal of business before long. Prices are still somewhat unsettled, but from \$27.50 to \$28 may be regarded as firm quotations in this market.

Old Rails.—Prices are almost nominal as regards this market, as no one seems inclined to pay the high figures asked for the lots that are in store, say, \$24.50 and upward. Sales have been made at from \$24 to \$24.75 for lots delivered to mills a little outside the city, but in view of the low prices quoted in Western markets, buyers are taking only small lots to cover immediate requirements.

Scrap Iron.—The demand is rather slow, and quoted prices not paid with much freedom: \$20 @ \$20.50 for cargo lots; \$21 @ \$21.50 for carload lots, delivered, or for choice \$22; No. 2 do., \$14 @ \$15; Turnings, \$13 @ \$14; Old Steel

Rails, \$20 @ \$21; Cast Scrap, \$15 @ \$16; do. Borings, \$9 @ \$10; Old Fish Plates, \$23 @ \$24; Old Car-Wheels, \$17 @ \$18, Philadelphia.

Wrought Iron Pipe.—The demand is fair, with unusually good prospects for large Pipe later on. There are some very important matters under consideration, which, if carried out, will give plenty of work during the spring months. Discounts, in a general way, are about as follows: Butt-Welded Black, 55 %; Lap-Welded Black, 65 %; Butt-Welded Galvanized, 45 %; Lap-Welded Galvanized, 55 %; Boiler Tubes, 62½ %.

Nails.—The demand is very light, but there is increasing steadiness in prices, and it is expected that the agreement to restrict production will soon be put into effect. Stocks are decreasing, and prices are steady at \$1.90 @ \$2 for lots from store, with the usual concessions on carload lots.

Edmund D. Smith & Co., 222 South Third street, have been appointed the exclusive sales agents for the Catocin Furnace Company, of Maryland, whose furnaces will again go into blast probably this month. "Catocin" Iron is one of the oldest and best-known brands of Pig Iron in this section, and the United States Government has numerous times stipulated for this make in its specifications for castings. They run entirely on their own ores.

Pittsburgh.

Office of *The Iron Age*, 77 Fourth Ave., }
PITTSBURGH, February 19, 1889. }

Some of the brokers report an increased inquiry, which is usually followed by an increased business, and the indications are that a great many orders will be placed within the next week or two. Within the past few days some of the mills have been started up single turn.

River navigation, after having been suspended for a couple of weeks by ice, has been resumed, and large shipments of all kinds of manufactured goods made. The shipments of Glassware have been unusually large of late, and mostly for the South. It may be stated here that the Glass factories are nearly all in full blast.

The river coal trade continues in bad condition, owing to the markets below being overstocked and very dull, and the prospect for improvement soon is not as encouraging as it might be. The Grand Lake Coal Company, one of our largest river companies, made an assignment within the past week. The liabilities are placed at \$250,000. The Grand Lake Company sold nearly all their coal at New Orleans; and in addition to having a good deal of bad paper, lost heavily by the storm at New Orleans some time ago, having had, according to report, some 500,000 bushels of coal sunk. It is understood that the banks here will lose heavily.

Pig Iron.—In regard to prices there has been no notable change since our last report. Rumors obtain of sales at a further decline, but they are not well authenticated. Bessemer Iron appears to be stronger. There are now but few, if any, sellers under \$16.50, cash, whereas there was a sale a couple of weeks ago at \$16.25, cash. We quote as follows:

Neutral Gray Forge.....	\$14.25 @ \$14.50, cash.
All Ore Mill.....	15.50 @ 15.75, "
White and Mottled.....	18.50 @ 14.00, "
No. 1 Foundry.....	16.25 @ 16.50, "
No. 2 Foundry.....	15.50 @ 15.75, "
No. 1 Charcoal Foundry.....	23.00 @ 23.50, "
Cold Blast Charcoal.....	25.00 @ 25.00, "
Bessemer Iron.....	16.50 @, "

The only sales of Bessemer reported were 500 tons at \$16.40 and 1000 tons at \$16.50.

Muck Bar.—There is little or nothing doing, and in the absence of sales we quote nominally at \$26.50 @ \$27, cash. Sellers generally are asking \$27, cash, and some of them intimate that they would not if they had advance cut under that price.

Spiegel.—Spiegel is quoted at \$28 @ \$28.50 for 20 %, and Ferromanganese at \$56 @ \$57 for 80 %.

Manufactured Iron.—There has been more inquiry the past week, and some large contracts are reported as having been closed; prices, however, continue easy, in sympathy with the raw material. We quote: Bars at 1.70¢ @ 1.75¢; Plates, 2.15¢ @ 2.20¢; No. 24 Sheet, 2.70¢ @ 2.80¢; Skelp Iron, 1.75¢ @ 1.80¢ for Grooved, and 2¢ @ 2.10¢ for Sheared—all 60 days, 2 % off for cash.

Wrought-Iron Pipe.—There is but little change to note in regard to the Pipe trade; there is a very fair business for this season of the year, but continued complaint in regard to prices, which are both irregular and unremunerative. It is difficult to quote prices in the unsettled condition of the market, as each firm make their own prices, and, with a sharp competition, whoever gets the business has to take it so low that there is nothing in it. Discounts are generally quoted as follows: On Black Butt-Welded Pipe, 55 and 5 % @ 57 %; on Galvanized do., 50 and 5 %; on Black Lap-Welded, 65 % @ 67½ %; on Galvanized do., 55 and 2½ %; Boiler Tubes, 65 %; 2-inch Tubing, 11¢ @ 12¢ per foot; ¼-inch Casing, 35¢ per foot.

Nails.—The Nail trade is improving somewhat, but far from being active, or what it should be at this season of the year; a couple of factories here are in operation, Jones & Laughlins and Chess, Cook & Co., but they are not running up to anything like their full capacity. Schoenberger & Co. have made no Nails for several months. Prices remain unchanged, and we continue to quote 12d to 40d at \$1.90, 60 days, 2 % off for cash.

Old Rails.—There have been no sales reported recently, in the absence of which we quote American Tees at \$23 @ \$24; sales, it is claimed, have been made as low as \$23, while some holders are asking \$24. Some of our best-informed brokers are of the opinion that just as soon as consumers commence to buy the market will do better, as the stock, both in first and second hands, is light. Rails are worth about as much at the seaboard as they are here, and as long as they cannot be imported from the other side, there is not likely to be much of an increase in stocks at the seaboard. Unlike almost everything else, the supply is growing less and less every year, as there are no new Iron Rails being made.

Steel Rails.—Heavy Sections are quoted for small lots at \$28 @ \$28.50, cash, but a large order could no doubt be placed considerably below the prices quoted.

Billets, &c.—Bessemer Steel Billets are dull and prices weak; sales reported at \$27.75 @ \$28. Owing to the continued dullness in the Nail trade, there is no demand for Nail Slabs, which may be quoted at \$27.50; Domestic Bloom Ends, \$17.50; and Domestic Rail Crops, \$18.50. No sales reported recently.

Merchant Steel.—There is an increasing demand, and the market is firmer, but prices remain as last quoted. Best brands of Tool Steel, 8½¢; Crucible Spring Steel, 4½¢; Crucible Machinery, 5¢; Open-Hearth do., 2½¢.

Railway Track Supplies.—Business continues light, but an improved demand is looked for soon, as there usually is at this season of the year. No change in prices. Railway Spikes, 2.10¢, 30 days; Splice Bars, 1.85¢ @ 1.90¢; Track Bolts, 2.75¢ with Square and 2.85¢ with Hexagon Nuts.

Old Material.—Trade in all kinds of Old Material continues light, but an improvement is looked for soon, as stocks in hands of consumers generally are light. Prices remain about the same as a week ago. No. 1 Wrought Scrap, \$20 @ \$20.50, net ton; Wrought Turnings, \$13 @ \$13.50; Car Axles, \$24 @ \$25; Cast Scrap, \$14.50 @ \$15, gross; Old Car-Wheels, \$19; Cast Borings, \$11 @ \$12, gross.

George H. Wrightman, formerly secretary of the Hartman Steel Company, Limited, has been appointed Northeastern agent for Carnegie, Phipps & Co., Limited, of Pittsburgh, with headquarters at No. 3 Mason Building, Boston.

Chicago.

Office of *The Iron Age*, 96 and 97 Washington street. CHICAGO, February 18, 1889.

Pig Iron.—The depth of the depression seems to be over, at least in this market. Pig Iron has been purchased very freely and prices are no longer as weak as they were. In fact, advances have been made on quite a number of brands of 25¢ to 50¢ per ton. Southern Irons are not so abundant as they were, and the few brands available from the South are said to be held very firmly at the higher rates asked. The dealers report that almost everybody using Pig Iron has been purchasing within the past two weeks; they seem to be disposed to buy at least the minimum that they will need this year. So many of them have done this that sellers are fearing that in a couple of months there will be no buying at all, and that prices will then drop again, unless business in finished products increases so that much more Iron will be needed than now seems probable. It must be said that in some lines, notably among architectural Iron works, the prospects are very bright for a great deal more work than was done last year. The railroads are buying so little at present that it seems almost inevitable that they must very heavily later in the year, and that the Pig Iron market will be well sustained. The manufacturers of Lake Superior Charcoal Iron are finding an accumulation of Nos. 1 and 2 and are disposed to make slight concessions on these numbers, which has imparted an appearance of weakness, which is a new feature with this class of Iron, as it has been so strongly held hitherto. Cash quotations are as follows, f.o.b. Chicago: Lake Superior Coke, No. 1, \$16 @ \$17; No. 2, \$15 @ \$16; No. 3, \$14 @ \$15; Chicago Scotch, No. 1, \$17.50; American Scotch (Blackband), No. 1, \$18.50 @ \$19.50; Jackson County Silvery, No. 1, \$18; other Ohio Soft Irons, No. 1, \$17.50 @ \$18.50; Lake Superior Charcoal, Nos. 1 and 2, \$19.50 @ \$20; Tennessee Charcoal, No. 1, \$19; No. 2, \$18.50; Southern Coke, No. 1, Foundry, \$16.50; No. 2 Foundry and No. 1 Soft, \$15.75 @ \$16; No. 8 Foundry, \$15.25 @ \$15.50; Gray Forge and No. 2 Soft, \$14.75 @ \$15.

Bar Iron.—The prospect is a little brighter, orders being more numerous than they were and inquiries widening very considerably. The demand seems to be coming from the smaller manufacturing consumers, who are evidently experiencing a heavier demand for their products. Prices are slightly easier and quotations are now about 1.67½¢, half extras, f.o.b. Chicago, for carload lots of good quality Common Iron. Slight concessions are made on this rate for large orders, but manufacturers are disposed to resist attempts to force prices down very considerably. A peculiarity of the present market seems to be the firmness with which a bottom rate is made, as it sometimes occurs that under such conditions as have recently prevailed a very weak seller can be found who will drop his quotations much below those of any of his competitors. Small lots from store are being sold at

1.80¢ @ 1.90¢ for Common Iron, and up to 2.10¢ for Iron of better quality, in small lots.

Structural Iron.—As reported last week, trade is beginning to move a little, but not much activity is expected in this line until March or April. Mill lots are quoted as follows, f.o.b. Chicago: Angles and Sheared Plates, 2.10¢ @ 2.12½¢; Universal Plates, 2.15¢; Tees, 2.55¢ @ 2.60¢; Beams and Channels, 2.90¢. Small lots from store are available at 2.35¢ for Angles, 2.70¢ for Tees, and 3¢ @ 3.40¢ for Beams and Channels.

Plates, Tubes, &c.—A very fair business has been transacted during the week, including quite a number of carload orders. The Boiler shops are now well filled with work, and enough business is in sight to keep them well employed all summer. The dealers in Plates, consequently, feel very cheerful over the prospect. Boiler Tubes are regarded as a very good purchase at present prices, manufacturers' agents here believing them now to be at bed rock prices. Small lots from store are quoted at the following rates: Sheet Iron, Nos. 10 to 14, 2.50¢; Sheet Steel, 2.75¢; Tank Iron, 2.40¢; Tank Steel, 2.60¢ @ 2.75¢; Shell Iron, 3¢; Shell Steel, 3.12½¢; Flange Iron, 4¢; Flange Steel, 3.50¢; Fire-Box Steel, 4.75¢ @ 5.75¢; Boiler Rivets, 4¢ @ 4.25¢; Ulster Iron, 3.75¢; Boiler Tubes, 62½¢ @ 65¢ off.

Sheet Iron.—Manufacturers' agents are selling a great deal more Galvanized Iron than last week. The demand is very general, including the cornicemen, car builders, and even the railroads to some extent. Prices of small lots are unchanged at 65 % off for Juniata and 65 % and 2½ % off for Charcoal. Black Sheets are a little weaker, without quotable change in prices, being nominally held at 3.30¢ for No. 27 Common from store and 2.95¢ @ 3¢, f.o.b. Chicago, for small lots.

Merchant Steel.—A fair trade is reported, but no large orders have recently been placed. Quotations are as follows, the lowest prices being for large lots: Soft Steel Bars, 2.10¢ @ 2.30¢; Tool Steel, 7.75¢ @ 8.50¢; Specials, 13¢ @ 25¢; Crucible Spring, 3.75¢; Open-Hearth Spring, 2.20¢ @ 2.50¢; Open-Hearth Machinery, 2.80¢ @ 2.50¢; Tire, 2.20¢ @ 2.50¢; Sheet, 7¢ @ 10¢.

Steel Rails.—Not much business has been transacted since our last report. The orders then in sight are still hanging, and the manufacturers are not feeling particularly bright over the future. Quotations are still \$30 @ \$30.50, according to quantity.

Old Rails and Wheels.—It seems probable now that bottom has been reached, for the present, in Old Iron Rails. Sales have been made at \$20, but other parties willing to buy at this price have not succeeded in securing the Rails. Some sales were made at slightly higher figures toward the close of the week, and it is believed that \$20.50 is now about the price which they are worth. Old Steel Rails have been sold at \$15 for pieces under 3 feet and \$18 @ \$20 for longer lengths, according to their condition. Old Car-Wheels are, nominally, worth \$19.

Scrap.—Material is not so plentiful as it was, and dealers are disposed to maintain quotations. The demand is only for small lots, and market is not being forced to take more. Mixed Country Scrap is still worth \$14. Quotations to consumers are as follows, per ton of 2000 lb: No. 1 Railroad Shop, \$20; Track, \$18 @ \$19; No. 1 Mill, \$14 @ \$15; Pipes and Tubes, \$18 @ \$14; No. 2 Mill, \$9; Axles, \$25; Horse-shoes, \$18 @ \$19; Machinery Cast, \$13.50 @ \$14; Stove Plate, \$11; Cast Borings, \$8.50; Wrought Turnings, \$11 @ \$12; Axle Turnings, \$13.50; Mixed Steel, \$11; Coil and Leaf Steel, \$15; Tires, \$15.

General Hardware.—The demand for Shelf Hardware is very fair and business is improving. While the first half of the month was not particularly rushing, the demand is considerably better now. Orders are coming in pretty rapidly for spring delivery, and the prospects are bright for a good trade later in the season. It is a peculiarity of some sections of the country that the merchants take stock in February, and that naturally restricts business somewhat during this month. No special changes have taken place in prices except a slight decline in Silver-Plated goods and also in Carriage Bolts, but while some lines are thus off a little, others are stiffening, and a general impression prevails that on the whole prices will be higher, rather than lower, and that now is a very safe time to buy goods. There is no chance for speculation, but simply for good business investment. The demand for Heavy Hardware continues good and the merchants are feeling much more cheerful than they were the latter part of last year. Collections are very good.

Nails.—The condition of the Steel Nail trade is about as it has been. Manufacturers' agents are very firm and refuse to make concessions, but jobbers are occasionally cutting the price for small lots when they can accomplish a purpose by so doing. The regular quotations by jobbers is \$2 for carloads and \$2.05 for small lots. The manufacturers of Wire Nails are no firmer than they have been, and jobbers' prices are still receding. Carload lots or mixed carloads can be bought at \$2.35, while \$2.45 is still the regular price for small lots.

Barb Wire.—A very good demand is reported, but prices are no stronger; in fact, the manufacturers do not seem to be trying to advance rates. The fight which has been prosecuted with more or less vigor for the last few years between those who draw their own Wire and those who purchase Wire is being pushed more bitterly than ever, and it is possible that prices will not improve until the trade has passed into fewer hands. The attitude of the manufacturers has pushed jobbers' prices down, and \$2.75 is now named for carloads or mixed carloads and \$2.85 for small lots. Galvanized Wire is offered at 60¢ ? 100 lb in advance of these quotations.

Pig Lead.—Prices have declined to 3.45¢ under sales of 500 tons for delivery in February and March, with manufacturers claiming to be well supplied for at least 60 days. There is a growing feeling that present prices are low and comparatively safe, but buyers are apathetic at present.

Chattanooga.

Office of *The Iron Age*, Carter and 9th Sts.,
CHATTANOOGA, February 18, 1889.

Pig Iron.—The situation is but little removed from that reported last week; there is a firmer feeling prevailing, although prices have undergone but little change. Sales are very active, which has resulted in much larger amounts changing hands than usual and there is not the supply on the market that there was a few weeks ago. Southern consumers are buying quite heavily, much more so than usual; in fact, it appears to be the general feeling among all consumers, North and South, that now is the time to lay in stocks for the next few months, and it is very largely being acted upon. What the effect of the storage and warrant system will in the future have upon the prices of Pig Iron yet remains to be seen—as yet the workings of it are not perfected. There seems to be somewhat of a difference of opinion expressed as to the effect upon prices. There are those who think that the storage of large amounts of Iron which is ready for delivery

at any moment will act as a menace to speculation and lead to an advance in prices. Should the furnaces rely upon this avenue of placing their product to a considerable extent, and this may withhold it from the market, it can hardly do otherwise than stiffen up the market to some extent and perhaps place it more on a conservative basis. This appears to be about the general opinion of those who have expressed themselves upon the subject. The question will eventually solve itself in this way. Should production continue to be greater than the consumption and stocks continue to accumulate in the different storage yards, there would be less danger from an extreme depression in prices, as has occurred in times gone by. It will give more time for the less-favored stacks to close up their business without such sacrifice as might otherwise occur. Upon the whole, the subject is being looked upon as a sort of balance-wheel that will act as a regulator of the Pig Iron business.

Cincinnati.

Office of *The Iron Age*, Fourth and Main Sts.,
CINCINNATI, February 18, 1889.

Pig Iron.—Confidence has gained ground in the local market during the week, and a fair volume of business has been transacted. Statistics show that there is very little accumulation of Iron now, and that production has been reduced to within a close proximation of consumption. Such conviction has given a stronger feeling to producers, and their feeling has been more generally communicated to buyers, who have acted upon such information as is reflected in the demand, which has been well distributed. No large individual sales have been reported, the largest being for 1500 tons No. 1 Southern Foundry at \$15; some have been reported sold at \$15.25. But while foundry grades have sold moderately well, the demand has been more for Forge Iron, 1000 tons Gray Forge selling at \$13, 1000 do. at \$13.25 and 1000 tons Mottled at \$12.50, cash; other lots of Mottled have sold at \$12.25. For Car-Wheel Iron the demand has been active, 5000 tons Southern reported sold on basis of \$25; moderate amounts of Lake Superior Car-Wheel have sold at \$21.50, spot. It is reported that present shipments from Southern furnaces are the largest on record. Generally speaking, a stronger tone prevails, with higher prices asked and obtained in some instances. The following are the approximate prices current here at the close for cash, f.o.b.:

Foundry.

Southern Coke, No. 1 (new classification).....	\$15.00 @ \$15.50
Southern Coke, No. 2 (new classification).....	14.50 @ 14.75
Southern Coke, No. 3 (new classification).....	14.00 @ 14.25
Ohio Soft Stone Coal, No. 1.....	15.00 @ 16.00
Ohio Soft Stone Coal, No. 2.....	14.50 @ 15.00
Maboning and Shenango Valley.....	16.50 @ 17.00
Hanging Rock Charcoal, No. 1.....	21.00 @ 22.00
Hanging Rock Charcoal, No. 2.....	19.00 @ 22.00
Tennessee and Alabama Charcoal, No. 1.....	18.00 @ 18.50
Tennessee and Alabama Charcoal, No. 2.....	17.00 @ 18.00

Forge.

Strong Neutral Coke.....	13.00 @ 13.50
Mottled Neutral Coke.....	12.25 @ 12.75
Gray Forge.....	13.00 @ 13.25

Car-Wheel and Malleable Irons.

Southern Car-Wheel.....	20.00 @ 25.00
Hanging Rock, Cold Blast.....	22.00 @ 25.00
Lake Superior Car-Wheel and Malleable.....	21.00 @ 22.00

Manufactured Iron.—Generally speaking, the market has been slow, but a few mills have been well supplied with orders, and prices have changed but little.

Nails.—The market has remained quiet and easy, without essential change in prices: 12d @ 40d sell at \$1.90 @ \$1.95 ? keg, with 10¢ rebate in carload lots at the mills. Steel Nails sell at \$1.90 @ \$1.95, and Steel Wire Nails at \$2.60 @ \$2.65 ? keg.

Old Material.—There has been a moderate demand for Old Rails, with small sales on line of O. & M. R. R. at \$21.50, cash; holders ask \$22 at the close, but buyers hold off. There have been small sales of old Wheels at \$18 @ \$18.50 ? ton, spot.

Birmingham.

BIRMINGHAM, ALA., February 18, 1889.

Pig Iron.—While prices in Iron remain practically unchanged, the feeling is confident and expectation of better things almost buoyant. The money market is easier than for some years, and from what the bank authorities say, it will be fair enough sailing for any legitimate business here for some time. The fact that after the stress of reaction from the boom has done its worst, the large majority of property here is utterly unencumbered, gives great encouragement to those who offer money, and they are more than ready to lend it on reasonable security. The Hull storage scheme has recently been much discussed, but the opinions arrived at are conflicting. One furnaceman said to your correspondent he thought it will help the furnaces by keeping up the price of iron; that if any of them become hard up they could get an advance which would enable them to tide over the pressure. Another's theory was that the lower the prices the better the chances for the advancement of this district, and Birmingham could afford to be independent of the storage schemer. The fact was pointed out that during the depression some years ago the few Birmingham furnaces in operation went along without cessation or embarrassment, and so it is held they will always do in any ordinary contingency. The district, that is including all North Alabama, is distinctly looking up. Progress has been largely made in mixing better grades, both of Coal and Iron Ore. Sheffield by this will be particularly benefited. The furnace at Trussville, this county, to which another will soon be added, will use Coke made from a Murphree's Valley vein of Coal, about 25 miles north of here. The operators who have worked the Pennsylvania Connellsville Coal say this Alabama Coal will make fine clear Coke, as good as can be produced anywhere in this country. The Sheffield people have been getting Coke from West Virginia until recently. Now they are beginning to receive consignments from new ovens in the Warrior Coal fields at Jasper, Walker County, about 40 miles south. There has been no break since the last report in the way of smooth operations in the district. One of the new furnaces at North Birmingham of the Sloss Steel and Iron Company will go in blast during the week.

Cleveland.

CLEVELAND, February 18, 1889.

Iron Ore.—None of the big mining companies has fixed prices, although there is no material difference of opinion as to what these prices will be eventually. Quotations for 1889 can be estimated almost to a certainty. Non-Bessemer Ores will bring 40¢ more ? ton than was paid at the beginning of last season, and Bessemer Ore from 25¢ to 35¢ more. One heavy consumer, when offered Bessemer Ore at 40¢ advance over last year's quotations, promptly offered to pay 30¢, leaving a difference of but 10¢ ? ton between the mine owners and the furnacemen. The Ore men are encouraged just at present by reports of increased demands for Steel Rails and Bessemer Iron, and a heavy buying movement is expected to follow the first announcement of quotations. It is said that 200,000 tons of Ore could be quickly disposed of now on the docks. Instead of this amount, there are less than

35,000 tons of unsold Ore to be obtained, and this is rapidly disappearing. A small lot of non-Bessemer Hematite Ore already on the docks is said to have sold for \$4.10 per ton during the past week. It is now confidently believed that several of the largest mining companies will fix prices within the next ten days.

Pig Iron.—The market has improved in tone. Three or four large manufacturers report a strong demand for Bessemer Iron, and it is thought that the tide has at last turned in the direction of the seller. A number of furnacemen have announced their intention of refusing to make additional concessions, despite rumors to the effect that Mill Iron has sold as low as \$15.25, cash, during the week just closed. Foundry Iron has also been reported a point or two lower, but only scattering and unimportant sales at the reduced figures have occurred. The outlook, as a whole, is decidedly more hopeful and an active buying movement is looked for early in March. A good deal of Iron is unquestionably going into consumption.

Old Rails.—A 1000-ton lot of Old American Rails was offered during the past week at \$21.80, and \$21.50 is probably a fair quotation.

Louisville.

LOUISVILLE, KY., February 18, 1889.

Pig Iron.—There has been no noticeable change in the market during the past week, and prices of Iron still remain at very low figures. Several furnaces have withdrawn from the market, and refuse to sell at present prices, seeming to think that the market must show some improvement in the next 60 days. Foundry Irons sold last week at remarkably low prices, making the prospect look almost as discouraging as ever, excepting that the movement taken by some furnaces in withdrawing from the market may cause better prices. It seems to be the universal opinion of Pig-Iron men that the market will show a change for the better in the near future. We quote for cash as follows:

Southern Coke, No. 1 Foundry, new classification.....	\$14.75 @ \$15.25
Southern Coke, No. 2 Foundry, new classification.....	14.25 @ 14.75
Southern Coke, No. 3 Foundry, new classification.....	13.75 @ 14.25
Gray Forge.....	13.25 @ 13.75
White and Mottled, different grades.....	12.75 @ 13.25
Silver Gray, different grades.....	13.00 @ 13.50
Southern Charcoal, No. 1 Foundry.....	16.25 @ 16.75
" " No. 1 Mill.....	14.75 @ 15.25
Southern Car-Wheel, standard brands.....	21.75 @ 22.75
Southern Car-Wheel, other brands.....	18.00 @ 19.50
Hanging Rock Coke, No. 1 Foundry.....	15.50 @ 16.00
Hanging Rock Charcoal, No. 1 Foundry.....	19.50 @ 21.00
Hanging Rock, Cold Blast.....	20.75 @ 23.75

St. Louis.

OFFICE OF *The Iron Age*, 212 N. Sixth st., }
ST. LOUIS, February 18, 1889. }

Pig Iron.—Shows little or no change, either as regards price or demand, from last week's report. While it is true a number of furnaces in the South have blown out, and others advanced their prices, yet consumers show no disposition to provide for future requirements, and are only in the market to supply the present needs, and seem to think that prices will be all right when they are in a position to become purchasers for future wants. Sales are for small lots, and large buyers seem to be out of the market, for the time being at least. We quote as follows, for cash, f.o.b. St. Louis.

Southern Coke, No. 1 Foundry, \$15.25 @ \$15.75	
Southern Coke, No. 2 Foundry, 15.00 @ 15.25	
Southern Coke, No. 3 Foundry, 14.25 @ 14.75	
Gray Forge.....	13.50 @ 13.75
Ohio Softeners.....	17.50 @ 20.00
Lake Superior Charcoal.....	21.00 @ 21.50

Missouri.

Charcoal Foundry, No. 1.....	16.00 @ 16.50
Charcoal Foundry, No. 2.....	15.00 @ 15.50

Tennessee.

Charcoal Foundry, No. 1.....	17.50 @ 18.50
Charcoal Foundry, No. 2.....	16.75 @ 17.50
Connessville Coke, f.o.b. East St. Louis, \$4.70; St. Louis, \$4.85.	

Bar Iron.—There is no demand to speak of, and small orders are the rule, while large lots still remain "in the near future." The outlook is improving, however, and a number of inquiries have been received for some good round lots, which, if prices are satisfactory, will be closed during the coming week. Irregularity in prices continues and it is difficult to quote with any degree of accuracy, as concessions are frequently made on orders for desirable specifications. Small lots from store are quoted at 1.85¢ @ 1.90¢, according to quantity and quality.

Barb Wire.—The volume of business continues large, and mills are well filled with orders, so much so that in some instances they are a week or ten days behind their orders. Prices show no improvement. Manufacturers think, however, that with the assistance of the spring demand the chances are favorable for some advance over the prices now ruling, which are as follows: Carload lots, Two and Four Point Painted, \$2.90; carload lots, Two and Four Point Galvanized, \$3.50, f.o.b. St. Louis; less than carload lots, 5¢ additional.

New York.

Office of *The Iron Age*, 66 and 68 Duane street, }
New York, February 20, 1889. }

American Pig.—The market is moderately active, and while some authorities in the trade note a slight improvement, facts are continually cropping up, which give the market an appearance of irregularity. Pressure to sell comes from various quarters, both North and South, in foundry and forge grades, and, although the quantities thus thrust upon the market are not large, the fact that low figures are accepted tells. It should be noted, however, that in some cases a small lot is put into so many hands to sell that the impression is created among buyers that large amounts are urgently offering. We hear of concessions in exceptional instances in Gray Forge and in No. 2 Foundry, and are informed that No. 1 can be purchased at \$17.50 for Standard Northern makes; White Southern Iron is still available at \$17 for No. 1. Standard Northern No. 2 can be purchased at \$16.25. The discrepancy between quotations at leading Western points and in the East, on Southern Iron has attracted attention. Taking \$14.75 at Cincinnati for No. 1, and adding the difference in freight, \$1.11, an equivalent of \$15.86 is reached. This is \$1 below the quotations made by Southern furnaces in this section. The only explanation offered thus far is that Southern representatives have not cut deeply because they have feared sharp retaliatory measures by Northern furnace companies. It would seem improbable that so great a disparity could long exist, however, and so long as there is not a marked advance in the West, Southern Iron will be a very serious menace to prices in this section. We quote standard Northern No. 1, \$17.50 @ \$18; No. 2, \$16.25 @ \$17.00, and Gray Forge, \$15 @ \$16, all at tidewater.

Scotch Pig.—We quote: Coltness, \$20.50 @ \$21; Shotts, \$20 @ \$20.50; Langloan, \$20 @ \$20.25; Summerlee, \$20.25 @ \$20.50 and Dalmellington, \$19.25 @ \$19.50.

Spiegeleisen.—We note sales of about 2000 tons of Foreign 20 % at \$26.75 ex-ship

and a small quantity of Domestic 10 to 12, @ \$22.50, delivered at mill in Eastern Pennsylvania.

Plates.—We quote Iron Tank, 2¢ @ 2.2¢; Shell, 2.25¢ @ 2.4¢; Steel Tank and Ship Plate, 2.15¢ @ 2.25¢; Shell, 2.35¢ @ 2.5¢; Flange, 2.6¢ @ 2.75¢, and Fire-box, 3¼¢ @ 4¢.

Structural Iron.—We quote Sheared Plates, 1.9¢ @ 2¢; Universal Mill Plates, 2¢ @ 2.1¢; Angles, 2¢ @ 2.10¢; Tees, 2.4¢ @ 2.6¢, and Channels and Beams, 2.8¢ on dock for all sizes.

Bar Iron.—We quote: Carload lots on dock, half extras, Common, 1.65¢ @ 1.75¢; Medium, 1.75¢ @ 1.8¢, and Refined, 1.8¢ @ 2¢.

Steel Rails.—The report of the Board of Control for the 1st of February shows that the sales by the mills to that date aggregated 494,441 tons this year, against 394,897 tons reported up to the same time a year ago. This shows an increase of 100,000 tons. We are convinced that now the orders aggregate at least 650,000, the total allotment being 777,968 tons. The shipments in January were only 64,352 tons, of which 41,374 tons were from two mills. Eight works shipped less than 2000 tons each, and six less than 100 tons. The returns of the Board of Control are particularly interesting from the point of view of the territorial distribution of orders. The Eastern mills, which includes the Pennsylvania, Bethlehem and the two Scranton mills, report sales of 213,978 tons; the Pittsburgh district, including Edgar Thomson and Cambria, have 173,640 tons. The Allegheny Bessemer, which does not report, may carry this to 200,000 tons. The three Chicago mills—the North Chicago, Union and Joliet—have, together, 108,823 tons. The same Eastern mills shipped last year 471,747 tons. The two Western Pennsylvania mills shipped 221,309 tons, and the Chicago group 402,686 tons. It will be noted how greatly the Chicago mills have suffered through the deplorable condition of the Northwestern railroads. Practically the great systems upon which they are dependent have not bought even a fraction of their requirements. Altogether there have been few large purchases. The following list embraces all the sales upward of 10,000 tons thus far: Pennsylvania Railroad, 51,148 tons; Union Pacific, 17,000; Erie, 20,000; Pacific Improvement Company, 10,000; Alabama Terminal, 14,123; Chicago, Burlington and Quincy, 11,250; Lackawanna, 10,000; Fort Worth and Rio Grande, 10,000; M. Kennedy, 13,558; S. Kneeland, 12,835; Lake Shore, 12,000; Lehigh Valley, 10,502; Lynchburg and Dunham, 10,000; Missouri, Kansas and Texas, 12,990, and Missouri Pacific, 15,000 tons. The absence of many large systems is noteworthy. The relative position of the three groups of works alluded to in the above has an important bearing in the markets. With possibly one exception, the active mills in the East have business enough to last them for a considerable period. Relatively speaking, they and two of the Pittsburgh mills are sufficiently well supplied with orders to be somewhat indifferent. So far as we can learn, none of the Eastern mills would now accept \$26, which was taken some weeks since. The majority ask \$27 or more, and it is very doubtful whether any lower offer would be entertained.

Old Rails.—We note a sale of 300 to 400 tons of American Tees, for delivery at Norwich at \$22 delivered.

Track Material.—There have been sales of round lots of Spikes, which we quote 2¢ @ 2.10¢. Angles remain weak at 1.80¢ @ 1.85¢, while Bolts and Square Nuts are quiet at 2.65¢ @ 2.75¢.

Financial.

The financial and business outlook has not distinctly improved during the week, although the tone is cheerful on all sides in prospect of more activity at an early day. Several important interests are affected by pending negotiations concerning railroad management and transactions are held in abeyance. Complaint comes from Chicago of much trouble in east bound freight cases from under-billing, false invoicing and other irregular practices, and a reduced margin of profit is advised, so that the indirect and weak lines shall be depressed of their opportunities. Taken together, the exhibit of gross earnings of railroads for January is much more favorable, contrasted with a year ago. The movement of cotton this year is in much larger volume. Commissioner Cooley, speaking of the railroad presidents' agreement, says: "The act to regulate traffic is, on the whole, conservative and beneficial, and its most vigorous provisions cannot inflict upon carriers subject to it so much mischief as the managers voluntarily bring upon themselves by the old abuses of these rate wars." All of the business exchanges will be closed on Friday next, Washington's Birthday.

The Stock Exchange markets were generally strong and active. Much uncertainty was caused by the attitude of the "Q" managers in reference to the agreement of the Interstate Railway Association, which was understood to have for its object the renewal of investments in the extension of Western roads. On Tuesday night President Adams was inclined to believe that all the signatures would be obtained. The same day, in this city, the Trunk line presidents agreed not to continue joint rate or other traffic arrangements with any connecting roads engaged in manipulations and devices which clearly violate recent agreements and the Interstate Commerce law. On Thursday B. & Q. advanced on the news that a quarterly dividend of 1 per cent. had been declared. On Monday a decline in St. Paul and other grangers was attributed to the refusal of the Iowa Railroad Commissioners to substitute the Illinois tariff for their own. On Tuesday the market was dull awaiting news from Chicago. The engagement of \$500 in gold for export had no effect. Jay Gould retired from the Board of Directors of the Delaware, Lackawanna and Western, owing to his health. The stockholders of the Bethlehem Iron Company voted to increase the stock from \$2,000,000 to \$3,000,000.

Government bonds are quoted as follows:

U. S. 4½s, 1891, registered.....	107½
U. S. 4½s, 1891, coupon.....	108
U. S. 4s, 1907, registered.....	128½
U. S. 4s, 1907, coupon.....	129
U. S. currency 6s.....	120

The total amount of bonds purchased to date under the circular of April 17 is \$117,668,450, of which \$51,337,300 were 4 per cents. and \$66,331,150 were 4½ per cents. The cost of these bonds was \$137,723,889, of which amount \$65,925,899 was paid for the 4 per cents, and \$71,797,990 for the 4½ per cents.

The weekly statement of the associated banks showed heavy gains resulting from bond purchases by the Government, as well as from receipts of currency, chiefly from the South. There was consequently a decrease of \$3,142,000 in surplus reserve, which now stands at \$17,293,000, against \$17,937,000 in 1888, and \$15,500,000 in 1887. Loans were slightly contracted. Specie increased \$3,715,400, and legal tenders \$209,700. Loans and deposits are now near the maximum, as compared with any former period.

Money is easy. Rates are 3 % for 60 days, 3½ % and 4 % for 90 days and four

months, and 4 and 5 % for longer dates. There is no change of importance in commercial paper, which is in good demand, and some banks are buying which have not been in the market for a long time. The market for sterling is firm at \$4.87 @ \$4.89½, to which point rates were advanced on Friday, so that it is not unlikely gold may be shipped profitably as an exchange operation for the first time in two years.

The exports from this port continue to show an increase as compared with last year. The total for the week ending today was \$7,798,498, cotton figuring very largely in the shipments. For the corresponding week of 1888 the exports were \$5,472,458.

General trade is quiet, but fully holds its own, compared with one week ago. The aggregate clearings of 42 cities show an increase of 28.5 %. Outside of New York the increase was 15.6 %. New York gained 36.1 %; Milwaukee, 32.6 %; Kansas City, 31.5 %; New Orleans, 28.6 %; Baltimore, 21.1 %; Chicago, 20.2 %; Pittsburgh 19.5 %; Detroit and Philadelphia, 13.6 % each; Boston, 13.4 % and St. Louis and Cincinnati 11.2 % each. Indianapolis decreased 72 %; Los Angeles, 46.1 % and San Francisco 5 %. In our local jobbing trade the movement in dry goods compares well in the amount of business done a year ago, but no rush is looked for before the beginning of March. There is some further cutting of prices, to prevent a diversion of trade to other points. Wholesale grocers notice a good distributive demand, excepting for coffee, which is sluggish. Flour is stiffly held despite a reaction in wheat, which is about 2¢ lower for spot. Reports received from Antwerp stated that the wheat crop in South America is a failure. The movement of corn is free from all the Atlantic ports and the exports of provisions are in excess of the same time last year, comprising 6,584,000 lbs. of lard and 12,500,000 lbs. of bacon. Cotton advanced ¼¢ for spot. As a whole prices have a lower range.

The advance statements of January exports from the United States show the movement under the four principal classes to have aggregated in value \$7,500,000 more than for the corresponding month of 1888, due to the larger movement of corn. For seven months the comparison with the previous year shows that the aggregate value of the four principal classes exported closely corresponds, as follows:

	1889.	1888.
Breadstuffs (7 months).....	\$73,814,700	\$82,501,764
Cotton (5 months).....	149,841,015	148,088,757
Petroleum (7 months).....	29,933,470	27,790,741
Provisions (7 months).....	57,263,581	53,593,081

Total.....\$310,852,766 \$311,924,348

Exports of specie from this port during the week were \$288,000, and the imports of specie \$379,000. Since January 1 the exports are \$3,885,000, as compared with \$3,465,800 for the same time last year. The imports of merchandise at this port during the week were valued at \$9,691,000, of which \$5,875,000, represents dry goods. Since January 1 the total is \$70,162,000, an excess of \$4,500,000, compared with last year.

The New York Board of Trade desires to co-operate with the movement originating in St. Louis to secure the enactment of a national bankruptcy law. The Direct Tax bill, though passed by both houses, hangs fire. There is little prospect of the passage of any revenue bill at this session of Congress. The Legislature of Delaware has passed an act repealing the law which imposed a tax of \$25 on persons selling goods by sample in that State. A new banking institution, to be known as the Cosmopolitan Bank, has been organized under the State laws, and will soon be located in the vicinity of Madison square.

Coal Market.

The Anthracite Coal trade is suffering from a glutted market and the companies struggle in the effort to uphold prices against the competition of large individual operators like Cox Bros. & Co. and Pardee & Co., who are represented as having decided between the alternatives of selling Coal at a concession or shutting down their collieries. "It is stated that Cox Bros. & Co.'s agent acknowledged having sold Broken and Egg Coal recently at \$3.50 per ton or less f.o.b. in New York harbor, and he also said that \$4 f.o.b. had been accepted by his firm for Stove and Chestnut sizes." According to report, the sales agents of the large companies, at a conference last week, seriously discussed the expediency of freezing out individual concerns by making a general slash in prices, but the final decision was to stand firmly in their present attitude. The Reading Company's accumulation at Port Richmond has increased to 225,000 tons, and yet they are unable to load their steam colliers in the absence of orders for Eastern shipment. A "high official" in Philadelphia is quoted as saying that no more collieries will be shut down at present, whatever individuals will do. Not altogether in harmony with this view, a prominent official of the Coal and Iron Company said: "I do not anticipate any change in prices. We are mining too much Coal; not only the Reading but all the companies. It must stop and stop soon or there will be trouble. It seems to me that all the Anthracite Coal miners ought to shut down for two weeks and tri-weekly next March, if need be. This policy was pursued in former years and there is no reason for departure from it now."

Apparently regardless of "trouble" in prospect, the production of Anthracite for the week ended February 16, was 565,505 tons, an increase of 105,000 tons over the previous week, but a decrease of 93,000 tons compared with the same week last year. Since January 1 the total is 3,788,000 tons, against 3,910,000 for the same time in 1888. Reading Railroad's Coal tonnage last week was 97,202 tons, an increase of 58,041 tons.

Bituminous Coal is unchanged, but a sharp competition is looked for in the effort to secure contracts soon to be offered. The percentages of production for shipment at tidewater are being averaged.

Metal Market.

Copper.—In the London market there has been no change in spot Chili Bars and good Merchantable, both remaining £77.-10/, but futures gave way from £75 to £71 yesterday, the sales summing up 1200 tons. Meanwhile in our own market the syndicate renewed its pool sale to manufacturers for a further period of three months, to date from April 1, for a total amount of between 12,000,000 to 16,000,000 lb at the old price of 16½¢. This is the only actual business that has transpired, nothing having been done on the Metal Exchange, where the nominal quotations for futures ranged from 16.95¢ down to 16.75¢ for February to April delivery, nominally. Casting brands are quoted 15½¢ @ 16¢; rumors have kept afloat with reference to negotiations between the syndicate and the Lake Mining Company for modifications in the subsisting contract on the basis of 15 % curtailed production. Furthermore, it was stated that the syndicate intends reducing prices in London, so as to stimulate thereby more liberal consumption. Details have now been received by mail from Paris relating to the panic there in Copper mining shares and those of the Société des Métaux. The drop was at one

time enormous in both, but it fully explained that the financial strength of the Société is unimpaired, the firm of Rothschild and several other powerful financial concerns lending all the aid to the Société which it stands in need of. Thus in reality it does not look as though anything like a collapse of the Société were at hand. The fact is that the Paris Stock Exchange, as well as that of London and leading Continental countries, is so much mixed up with Copper shares that bear raids are almost of weekly occurrence, drawing their substance from all sorts of mendacious rumors and pure inventions. The actual product of the 11 Lake Superior mines in January was 4557 tons, as compared with 3686 in 1888. The accounts from the Calumet and Hecla about the continuance of the fire seemed to have in reality but little significance. Spot Copper advanced this morning from £77. 10/ to £77. 12/6, and futures from £71. 10/ to £72. 10/. Lake closed firm at 16½¢ @ 16¼¢.

Tin.—There has been a further decline in spot Tin in London from £94. 12/6 to £94 yesterday, and in futures from £97. 7/6 to £94. 15/, sales summing up 650 tons. Here the market followed suit by degrees, 10 tons spot being sold at 21.80¢, 10 tons April at 21.45¢, and subsequently 10 tons February and 10 tons April both at 21¢. As per cable from Gilfillan, Wood & Co. to Mr. Ch. Nordhaus, their agent, 89 Water street. The shipments of Tin from the Straits settlement during the fore-half of the current month to the United States have been 500 tons, as compared with 200 same time last year. Since January 1 they were 1050, against 600, and to England 3700, against 4300. There being no change in London, the closing price of spot Tin is 21¢ here. **Tin Plates.**—In Tin Plates on the spot very little has transpired, and that little at rather weaker prices. In futures some orders for Cokes have been placed, yet a considerable quantity are still held back awaiting lower prices in Wales, and these are gradually coming about. We quote, large lines, per box: Siemens-Martin Steel, Charcoal Finish, \$4.75 @ \$5.50; Terns \$4.12½ @ \$4.25; Coke Tins, \$4.22½ @ \$4.30, and Wasters \$4.12½ @ \$4.15. The quotation in Liverpool is unchanged at 18/ for Coke Tin.

Lead.—In the absence of an active consumptive demand the market has been ill sustained, and some 200 tons were sold at 3½¢, the tendency still being downward, speculators for a rise seemingly not having courage enough to take hold of the metal, low as it is. Out West the quotation has ranged between 3.40¢ and 3.45¢. In London during the week Soft Spanish declined from £12. 15/ to £12. 10/, and English Pig from £13 to £12. 15/.

Spelter.—The demand being the reverse of active, and Ores obtainable at some reduction in the West, weakening influences have been brought to bear on the market, so that Common Domestic has to be quoted 4.90¢ on the spot. Production in 1888, as per statement of Mr. Ch. Kirckhoff, Jr., agent of the Geological Survey, is shown to have been 55,913 tons of 2000 lb, Illinois having produced 22,445; Kansas, 10,442; Mississippi, 13,465, and Eastern and Southern States 9561. Gradually the United States are thus becoming quite large producers of Spelter. Silesian declined in London from £17. 12/6 to £17. 7/6, the quotation here being 5½¢ nominally.

Antimony.—Has been moderately dealt in on the spot for actual consumption at 18½¢ Cookson and 11½¢ Hallett.

New York Metal Exchange.

The following sales are reported:

MONDAY, February 18.	
10 tons Tin, February	21.00¢
TUESDAY, February 19.	
10 tons Tin, April	21.00¢

British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, February 20, 1889.

The syndicate agents have continued to purchase Chili Bar prompts at £77. 10/, but consumers, it is said, have been buying at a lower price. The official prices for three months' futures have been reduced to £71 @ £72, in the absence of supporting purchases to offset "outside" transactions, but these prices are still a full £5 above what sales are said to have been made at on the street "ex-syndicate." Transactions in sellers' option all the year are reported at £61 @ £68. The market is in a chaotic state, suggesting almost complete absence of speculative support from the syndicate interest, for the time being.

Stocks in public stores increased 6000 tons the first half of February, and the supply of Anaconda Matte in Europe is now said to be at least 24,000 tons. The Chili charters for last half of February, as per telegraph, amount to 1000 tons.

It is reported from Paris that the organization of a new company, to be known as the Compagnie Auxiliaire des Metaux, has been formed, with a capital of £1,600,000, to assist the Société des Metaux. Negotiations are said to be pending between the two organizations for the transfer of a large amount of present Société des Metaux holdings. The total of the latter is said to represent an actual outlay of £11,000,000.

The report also has circulation that a loan of £1,000,000 has been obtained from London and Continental bankers, against which cash warrants have been pledged to a total, it is stated, of over 20,000 tons.

The syndicate agents have accepted upward of 4,000 tons of good merchant copper, on contracts, purchased at £79 several months ago.

The formation of the projected Copper Bank has not progressed, and it seems to be the opinion in most quarters that it is a failure from the present outlook. The difficulty is not so much a matter of financing under certain conditions, as in respect to inducing the large mining companies to adopt measures that capitalists think most advisable. As matters stand the capitalists require that the producers curtail their output and continue on at the original prices. The mining companies, it is said, are willing to accede to the request so far as restricting the production is concerned, but only on the condition that they are compensated.

Prices for Block Tin have fluctuated widely, touching as low as £98. 10/, under the influence of heavy selling. Sales are said to have been large against extensive supplies expected from the Straits, and now about due. There has also been considerable realizing by holders who have carried stocks for some time past. The report has been made that the Chinese have increased the production of late, but this was subsequently denied flatly. Cash purchases have increased in volume considerably during the latter portion of the week, and the market premium on cash Australian has widened out to 12/6.

The Pig Iron market has continued active and a further advance is asked in nearly all sections. Most Scotch brands have been sold at about 6d advance, as have also Middlesboro makes, but no further rise is noted on Hematite. Additional furnaces are starting up under the stimulus of the enhanced prices and brisk demand, more particularly in Scotland. Freight from Glasgow to New York are 1/ higher.

The Continental and English Steel Rail makers are soon to hold another meeting in London, to complete the formation of the proposed syndicate. No further change has taken place in the prices for Rails or Billets, but makers generally are asking 5/ advance over the prices at which Blooms and Slabs were sold last week.

Business in Tin Plates has been comparatively small again. Prices show slight irregularity, but the bulk of the transactions are still at an average of 18/ for B.N. grade Cokes. The Yuiscedwyn Works have started up.

Scotch Pig.—There continues to be a good trade and prices are strong throughout.

No. 1 Coltness, f.o.b. Glasgow	52/6
No. 1 Summerlee, " "	51/
No. 1 Gartsherrie, " "	49/
No. 1 Langloan, " "	51/
No. 1 Carnbroe, " "	44/6
No. 1 Shotts, " at Leith	50/6
No. 1 Glengarnock, " Ardrossan	48/
No. 1 Dalmellington, " "	44/3
No. 1 Eglinton, " "	42/9
Steamer freights, Glasgow to New York, 5/;	
Liverpool to New York, 10/.	

Cleveland Pig.—Trade in this line has continued brisk and prices are 6d higher than a week ago. No. 1 Middlesboro', G.M.B., 38/6; No. 3 ditto, 35/.

Bessemer Pig.—The demand continues lively and the market strong. West Coast brands, mixed numbers, 46/, f.o.b. shipping point.

Spiegeleisen.—A good demand is still reported and prices are very firm. English 20¢ quoted 80/, f.o.b. N. W. England shipping point.

Steel Rails.—There is still an active demand, and prices are strong. Heavy sections quoted at £4. 10/, and light sections £4. 15/ @ £5, f.o.b. at N. W. England shipping point.

Steel Blooms.—Business moderate, but makers very much firmer. We quote £4. 2/6 for 7 x 7, f.o.b. at N. W. England shipping point.

Steel Billets.—The demand continues fairly active at firm prices. Bessemer, 2½ x 2½ inch, £4. 5/, f.o.b. at N. W. England shipping point.

Steel Slabs.—The market very firm, but demand merely fair. Bessemer, £4. 2/6, f.o.b. at N. W. England shipping point.

Old Rails.—Transactions moderate, but generally at firm prices. Tees quoted at £3. 5/ @ £3. 6/, and Double Heads, £3. 8/ @ £3. 10/, c.i.f., New York.

Scrap Iron.—A moderate demand only and prices unchanged. Heavy Wrought quoted at £2. 2/6 @ £2. 7/6, f.o.b.

Crop Ends.—Demand rather slow, but sellers firm. Bessemer quoted £2. 10/ @ £2. 12/6, f.o.b.

Tin.—The market very irregular and looking weak. Straits quoted at £98. 10/ @ £98. 15/, spot, and £94 @ £94. 10/ for three months' futures.

Tin Plate.—Very little change in business or demand, and prices about the same as last week. We quote, f.o.b. Liverpool:

IC Charcoal, Allaway grade.....	15/3 @ 15/6
IC Bessemer Steel, Coke finish.....	13/6 @
IC Siemens.....	13/6 @
IC Coke, B. V. grade.....	12/ @ 13/3
Charcoal Terne, Dean grade.....	12/ @ 12/6

Manufactured Iron.—Common Bars are a shade lower. Otherwise former prices rule, and the market continues fairly active. We quote, f.o.b. Liverpool:

Staff. Ord. Marked Bars.....	£ s. d. @ 8 2 6
Common.....	@ 5 12 6
Staff. Bk Sheet, singles.....	7 12 6 @
Welsh Bars (f.o.b. Wales).....	5 2 6 @ 5 5 0

Copper.—Outside of speculative trading very little doing. Prices are still unsettled and irregular. The nominal prices are: Chili Bars, £77. 10/ for spot, and £85 @ £72 for futures. Best Selected, £78 asked.

Lead.—The demand slow and prices barely steady. Quoted at £12. 10/ @ £12. 12/6 for Soft Spanish.

Spelter.—Trade moderate at slightly lower prices. Quoted at £17. 5/ @ £17. 7/6 for ordinary Silesian.

Detroit.

WILLIAM F. JARVIS & Co., successors to Chas. Himrod & Co., under date of Feb. 18, 1889, report as follows:—**Pig Iron.**—There is scarcely any change in the market since our last report. Lake Superior Charcoal is moving a little more freely, but the majority of buyers still cling to the idea that this grade must come down, in sympathy with the constantly lowering quotations on Coke Irons. Thus far, makers stubbornly refuse to accept orders, unless full prices are obtained; consequently buyers are ordering only for immediate wants. As consumption and production are so nearly equal on this grade, it looks reasonable that, unless some furnace gets hard up, and in order to force buying offers at a sacrifice, buyers, when they can no longer put off placing their orders, will have to pay prices asked; but, if a few furnaces accept less, the majority are likely to follow suit, and ruinous prices will result, and no more Iron be sold than would have been at the higher prices. For the present we quote as follows:

Lake Superior Charcoal, all numbers.....	\$19.50 @ \$20.50
Lake Superior Coke, all ore.....	18.75 @ 19.25
Lake Superior Coke, cinder mixed.....	17.75 @ 18.25
Standard Ohio Black Band.....	18.75 @ 19.25
Southern No. 1.....	17.00 @ 17.50
Southern Gray Forge.....	15.00 @ 15.50
Southern Silvery.....	16.50 @ 17.00
Jackson County (Ohio) Silvery.....	18.25 @ 18.75
Old Wheels.....	18.50 @ 19.00

Foreign Markets.

EQUIVALENTS.

Franc, Peasants or Lire.....	Centis. 19.3
Florin (Netherlands).....	40.2
Florin (Austria).....	35.9
Escudo (Portugal).....	51.08
Escudo (Brazil).....	54.6
Mark (Germany).....	23.3
.....	2.206
.....	134.

CHILI.

VALPARAISO, December 21, 1888.—**Copper** was at first well sustained, but toward the close buyers withdrew in consequence of unfavorable cablegrams. Sales for the fortnight reached 12,138 quintals, at from \$27.60 @ \$27, the latter equaling £75. 14/ with 30/ freight to England. **Cool.**—A cargo of Newcastle West Hartley fetched 36/ on the spot, while later shipments have been paid 46/8, and are at present held at 45/. **Exchange.**—Drafts on London, 90 days' sight, are bringing 28% d.—**Weber & Co.**

WEST INDIES.

PORT OF SPAIN, TRINIDAD, January 18, 1889.—**Asphaltum.**—Our market has been moderately active and well sustained at \$14.04 3/4

ton for Boiled, and \$6.84 for Crude, free on board, including export duty. Since beginning of the month there were shipped 1503 tons, as compared with 278 tons same time last year, and 975 tons in 1887. **Exchange** on London, 90 days' sight, \$4.77 @ \$4.83.—**E. P. Masson.**

EAST INDIES.

MANILA, February 11, 1889.—**Hemp.**—There have been buyers at \$15.15-16 3/4 picul, against \$9.5-16 same date last year, equaling 3/4 ton, cost and freight, £54, against £33. Clearances for the United States since last cable amounted to 8000 tons as compared with 2000 tons in 1888; since January 1, 44,000, against 19,000; loading for the United States, 38,000, against 18,000; cleared for England since January 1, 28,000, against 21,000; loading for do., 8000, against 11,000; cleared for all other ports, 4000, against 4000; receipts at all ports since last cable, 18,000, against 9000; and since January 1, 78,000 bales, against 58,000 in 1888 and 52,000 in 1887. **Freight.**—\$7.50, against \$5.50. **Exchange.**—6 months' sight 3/8, against 3/8.—**Kerr & Co.**, through their agent, **Mr. Charles Nordhaus**, New York.

PENANG, January 9, 1889.—**Tin.**—Receipts during the fortnight reached 18,000 piculs, of which Europeans took 80,000 and Chinese 5000. The market opened on the 22d ult. at \$36.70 3/4 picul, closing at \$37.80, at which both Europeans and Chinese have continued buying.—**Schmidt, Kusterman.**

SPAIN.

BILBOA, January 26, 1889.—**Iron Ore.**—Very little transpired during the week, sales being limited to a few cargoes of Rubio, which may be quoted 7/ @ 7/3; for Campanil the quotation is 8/ @ 8/3, although it is stated that five companies have clubbed together and refused 8/8, in view of the scarcity of that kind of Ore. There is no impediment to a rapid dispatch of steamers, so that the export is so far ahead of last year, having been since January 1 286,115 tons, against 276,019 same time last year. **Pig Iron.**—There were shipped during the week 2240 tons coastwise and 2525 abroad, the latter by the Vizcaya Company.

February 2, 1889.—The market has continued with a good inquiry without leading to much doing, prices remaining unaltered. There are steamers enough waiting to take their turn in loading, with a joint capacity of 125,000 tons. Total shipments to-day 345,212 tons, against same time last year 359,747. **Pig Iron** has been dull with only 815 tons shipped coastwise.—**Bilboa Maritimo y Comercial.**

BELGIUM.

BRUSSELS, February 9, 1889.—**Iron.**—The Belgian Iron market has continued firm without changing quotations. Consumers gradually subscribe to the higher prices fixed, business thereby continuing its normal course. A good deal of Forge Pig has been selling to arrive at 4.60 @ 4.70 francs 3/4 100 kg., all the way to July 1, a circumstance lending the general market a certain degree of stability, with a likelihood of Finished Iron soon being further advanced in price. The January production of Pig Iron has been 75,640 tons, 32 blast furnaces remaining blown in and 18 blown out. Steel Beams go on gradually superceding Iron Beams, M. Boel, of La Louviere being so far the chief producer. Steel is in good request. The Puyguez Works made a contract for 1500 tons for Switzerland, and 3000 tons for Mexico. All bolt and Steel works have booked orders enough to last them for several months. Negotiations for the renewal of the International Electrical Syndicate have been resumed, but so far led to nothing, the pretensions of one of the Belgian mills being the obstacle. As for the Belgian share in the cupolas for the Meusefort, it may be stated that it amounts to 3,000,000 francs.—**Moniteur des Interets Matériels.**

GERMANY.

HAMBURG, February 9, 1889.—**Iron.**—The improvement in the Rhenish-Westphalian Iron market has continued during the week, there being quite a revival in the Pig Iron demand for a couple of weeks past. The activity in Spiegel (10 to 12 % Manganese), has been such, both for home use and export, that the price has been pushed to 61 marks 3/4 ton. The rolling mill's are quite inclined now to buy Forge Pig to arrive all the way to July 1, stocks having been completely absorbed in the hands of various producers. Siegen is now getting 53 marks, and the syndicate fixed the range at 52.50 @ 54. Foundry Pig is just as lively, White bringing 52.50 @ 53; Bessemer, 57; Luxembourg White, 34 @ 35 and over, and Gray, 40 @ 43; English Bessemer, 45/. Finished Iron is doing well for home consumption, with orders all the way to July 1. Hoop Iron is remarkably active, the general impression being that the tendency in all rolling mill products is bound to remain upward for months to come, hence the general rush to secure at current prices whatever hands can be

laid on. The Wire branch is also gaining at an advance of 10 marks 3/4 ton, both Rhenish-Westphalia and Upper Silesia. Tolerably satisfactory reports are made by foundries and machine shops; they find it difficult to keep pace with the advancing raw material. Car works are loaded down with orders, those for the week summing up 7000 freight cars and 5000 passenger and luggage cars. Dortmund quotes Wire Rods, 116 @ 118; Steel Rails, 120 @ 130; do Sleepers, 120 @ 125, and Steel Rails for mines, 110 @ 115. **Metals.**—Firmness is noticeable in Lead and Spelter, and weakness in Copper.—**Borsenhalle.**

HOLLAND.

ROTTERDAM, February 5, 1889.—**Tin.**—Since the beginning of the month the Tin trade in Holland has been the reverse of brisk, although a good undercurrent of inquiry exists since the last auction of the 31st ult., which established a rise of 1/4 guilder. Holders are not anxious to go on selling at 59.25 for spot Banca and Billiton, and 59.50 futures.

The following statement shows the position of Banca Tin in Holland on the 31st January from the official returns published by the Dutch Trading Company:

	1889.	1888.	1887.
Import in January, Slabs.....	15,000	23,399	12,499
Deliveries in January, Slabs.....	7,950	5,200	14,895
Stock, second hand, Slabs.....	42,940*	36,309	30,796
Unsold Stock, Slabs.....	129,371	73,745	43,424
Total Stock, Slabs.....	172,311	110,054	74,210
Afloat, piculs.....	5,000	3,000	4,000

* Including to-day's sale.

Statement of Billiton:

	1889.	1888.	1887.
Import in January, Slabs.....	3,298	5,500	11,387
Deliveries in January, Slabs.....	4,535	7,083	8,070
Stock, Slabs.....	19,561	14,595	25,888
Afloat, piculs.....	17,000	18,000	12,500
Quotation 31st January:			
Banca, florins.....	58 1/4	98	61 1/4
Billiton, florins.....	58 1/4	98	61 1/4

The preceding combined returns of Banca and Billiton for 1889, compared with those for 1888, exhibit:

	Slabs.	Equal to Tons.
A decrease of the import for January of.....	10,601	331
An increase in the deliveries for January of.....	252	8
An increase of the stock second hand of.....	11,597	362
An increase of the unsold stock of.....	55,626	1,738
An increase of the total stock of.....	67,228	2,101
A decline of the quotation of Banca of florins 30 1/4 equal to £85. 5/ 3/4 ton.		

—**De Monchy & Havelaar**

Long Wire Rope Cables.—The *St. Louis Globe Democrat*, of recent date, prints an interview with Joseph D. Bascom, of the Broderick & Bascom Rope Company, St. Louis, in the course of which he gave the following statement of long cables, all of them being 1 1/4-inch in diameter:

For	Length, feet.	Weight, pounds.
St. Louis, Mo.....	35,400	98,100
St. Louis, Mo.....	30,950	78,762
Omaha, Neb.....	28,900	75,218
Cincinnati, Ohio.....	27,241	70,071
St. Louis, Mo.....	24,250	62,561
Kansas City, Mo.....	23,500	64,235
St. Louis, Mo.....	22,300	57,025

The first rope in the above list is the longest and heaviest rope ever made—35,400 feet. The weight of this cable, with the reel, was 110,000 pounds. Each rope is made in one continuous piece, without splice. The cables are shipped on cars built especially of 140,000 pounds capacity. The company has recently erected a new and commodious factory, which they have equipped with the latest and most improved machinery, principally of their own designing. They are now enabled to manufacture wire ropes of any size and length up to 100 tons weight in one continuous piece, with absolute uniformity of lay under equal strain on each wire, and without twisting the individual wires.

Hardware.

There has been some increase in the volume of business since our last report, and the market continues fairly active, but buyers show little disposition to purchase largely, limiting their orders for the most part to moderate assortments, in which season goods have a prominent place. Prices are exceptionally steady, there having been during the past week no changes of importance.

Cut Nails.

The New York market is quiet, as is usual at this season of the year. It is noted, however, that two mills which have at times been pressing sellers in this market are now shut down. The committee of the association is still at work elaborating the details of the plan similar to that now in force in the Ohio Valley, where it is said to work with general satisfaction. We continue to quote \$1.80 @ \$1.90 for carload lots on dock.

Barb Wire.

The Western papers are publishing, with glaring headlines, such as "Good News for the Farmers," the following Associated Press dispatch, dated St. Louis, February 18:

The discovery has been made here that the control of the Barbed-Wire patents is not vested in any American firm or corporation, because the device of Barbed Wire was patented in France, to Louis Janin, on April 19, 1865. The law of this country, as declared by the United States Supreme Court, is that "A foreign patent for the same thing, or a description of the thing in a foreign publication, is as effectual to void a patent as if the patentee had seen the prior invention, notice to him not being important." If this decision holds, and there is no appeal from it, the claims of certain persons for royalty under the Glidden and other Barbed-Wire patents are void, and all the money paid to them by the Barbed-Wire manufacturers who had no interest in the Glidden patents is believed to be subject to recovery.

The "discovery" to which reference is made in the above dispatch was the publication of the fact cited in a recent issue of the *Scientific American*. Regarding this matter the Washburn & Moen Mfg. Company say in a private letter, from which we are permitted to make the extract, as follows:

We have the paper (*Scientific American*) before us, and have read the article to which you refer. Assuming the facts to be as stated, it is not necessary for us to consider what bearing this might have upon the Kelly patent, because that patent is now expired. Our only interest is in the bearing it has upon the Glidden patent No. 157,124, and we do not think it would affect that in any way. Glidden does not claim to have invented spurs or prongs; indeed, he distinctly disclaims that in his patent No. 150,683. What he does claim in No. 157,124 is a "twisted Fence Wire with a spur Wire bent at its middle portion about it and clamped in position by the other Wire strand," and the French patent in question is no anticipation of the Glidden invention.

The Washburn & Moen Mfg. Company are now pushing the infringers upon the Glidden patent vigorously, with a view to effecting a settlement of the points at issue as early as possible. The Glidden patent will expire in two to three years, and the policy of the contestant is said to be the delaying of proceedings until after that time. The dispatch above printed evi-

dently discloses one of the points on which they will rely for their defense, and which will necessarily consume time in its thorough investigation as a vital point. It is difficult to see how farmers will be benefited if the fact proves to be true as stated, as the price of Barb Wire could hardly be lower, being now sold at cost or under it, and a refund of royalty paid would hardly reach the consumer.

Miscellaneous Prices.

Payson Mfg. Company, 1819-1825 Jackson street, Chicago, Ill., issue circulars with revised price lists showing the addition of some patterns. One of these is devoted to their Payson's Perfect Sash Locks, which are subject to a discount of 60 and 10 per cent. The different patterns are effectively illustrated. Another circular is devoted to their Transom Lifters, the Universal being quoted at discount 45 and 5 per cent., and the Imperial at discount 50 per cent.

Athol Machine Company, Athol, Mass., make seven sizes of American Meat Choppers, as per following list, which is subject to a discount of 30 per cent.:

No.	1	2	3	A	4	B	5
Each ..	\$5	7	10	12	25	50	60

These machines, as well as other goods of their manufacture, are illustrated and described in a convenient pamphlet.

The following is the discount sheet of the Moore Mfg. and Foundry Company, Milwaukee, Wis., in which it will be observed that the different goods of their manufacture are arranged alphabetically. Terms, 60 days, or 3 per cent. discount for cash in 10 days, f.o.b. Milwaukee or Chicago:

	Discount per cent.
Acme Barn Door Rollers.....	55
Baggage Car Door Hangers.....	33½
Brackets, for Rail.....	25
Carriers, for Hand Hoists.....	20
Ceiling or End Pulleys.....	40
Chain, Log Haul.....	25
Climax Barn Door Hangers.....	60
Wood Track ..	55
Differential Pulley Blocks.....	40
Dumb Waiter Pulleys.....	50
Hay Fork Pulleys.....	40
Hooks, Floor.....	40
Hand Hoists.....	20
Stationary.....	20
Log Binders.....	25
Novelty Tackle Blocks.....	50
Snatch Blocks.....	50
Parlor Door Hangers.....	50
Parts for Differential Blocks and Hand Hoists.....	40
Railroad Hangers.....	55
Rail, Double Flange Barn Door, per 100 feet, \$1.50.....	Net
Rail, Extra Heavy, for No. 5 Railroad Hangers, per 100 feet, \$3.50.....	Net
Rail, Channel, for Zenith Hanger, per 100 feet, \$2.50.....	Net
Rail, Wrought Iron.....	25
Rollers, for Heavy Doors.....	50
Sash Pulleys.....	50
Sheaves for Novelty Blocks.....	50
Side Pulleys.....	50
Sliding Door Sheaves.....	50
Street Car Door Hangers.....	50
Stay Rollers.....	70
Tackle Blocks, Japanned.....	50
Universal Door Hangers.....	45
Vises, with Offset Jaws.....	20
Wild West Door Hangers.....	45
Wood Track Barn Door Hangers.....	55
Zenith Barn Door Hangers.....	55

Arnold & Co., Norwalk, Conn., manufacturers of Stable Fixtures, Truck Casters, Barn Door Hangers, &c., announce the following revised discounts:

Giant Truck Casters.....	dis 30 %
Socket Truck Casters.....	dis 50 %
Stationary Truck Casters.....	dis 50 & 10 %
Best Anti-Friction Hangers.....	dis 60 & 10 %
Boss Anti-Friction Hangers.....	dis 60 & 10 %
Duplex Wood Track Hangers.....	dis 60 & 10 & 15 %
Boss Anti-Friction Roller.....	dis 10 & 5 %
Union Roller.....	dis 70 & 5 %

The Carriage Bolt market is without further change, and manufacturers complain that the recent reduction in the combination prices of the goods leaves but a narrow margin of profit. There is also

reason to think that there is more or less covert irregularity in the prices of the goods.

The market for Augers and Bits appears to be in a somewhat improved condition, and some of the manufacturers have slightly advanced their prices. It is to be noted that Augers especially indicate this improvement.

There is a slight improvement in the File market, as one or two of the manufacturers have advanced their prices about 5 per cent. The quotations of the other makers remain, however, as they have been, and the general price of the goods is unchanged.

Gaston, Weston & Ladd issue a neat catalogue and price list relating to Gaston's Silver Compound, Gaston's Prestoline, Easton's Prestoline Paste, and Lillibridge's Old English Polish, in which these different articles are described, with a statement as to their advantages and their adaptation to the uses for which they are intended. Among them Prestoline, which is a liquid metal burnisher intended for use on metals other than silver and gold, is given a prominent place, and high claims are made for its merit and efficiency. It is described as working rapidly, not gumming in use, convenient and cleanly to use, not soiling woodwork, finely adapted for bronze, nickel and zinc, as well as other metals, and possessing other advantages which commend it to the trade. A similar Polish is put up in the form of Prestoline Paste. A number of testimonials in which the merits of Prestoline are alluded to are given. We give below the prices at which these goods are sold, the lists being subject to a discount of 20 and 10 per cent.:

Gaston's Prestoline.

	Per dozen.
Small Size, No. 0.....	\$1.25
Half Pints, No. 1.....	3.00
Quarts, No. 2.....	9.00
Half Gallons, No. 3.....	15.00
Gallons, No. 4.....	28.90

Gaston's Prestoline Paste.

Small Family Size, 3 dozen in box.....	.60
Large Family Size, 2 dozen in box.....	1.20
Quarter Pound, 1 dozen in box.....	2.00
Half Pound, 6 dozen in case.....	3.60
One Pound, 8 dozen in case.....	6.00
2½ Pounds, 2 dozen in case.....	12.00
Five Pounds, 1 dozen in case.....	22.20
Ten Pounds, ½ dozen in case.....	42.00

Gaston's Silver Compound.

No. 1, Small Size, (2 ounce).....	3.00
No. 2, Regular Size, (4 ounce).....	6.00

The following are the quotations of goods manufactured by A. W. Bishop, Berea, Ohio, descriptions of which are given in his catalogue:

Animal Poke—I. X. L., per doz.....	\$6.50
O. K., per doz.....	5.50
Pioneer, per doz.....	3.75
American, per doz.....	3.00
Buckeye Sash Locks, per gross.....	4.80

Obituary.

Rice, Born & Co., New Orleans, La., send out in appropriate form the following obituary notice of Jacob Born, to whose death we referred in a recent issue; as relating to a prominent Hardwareman who achieved a large degree of success and was held in high esteem, it will be of interest, and it will be especially so to many in the trade who had an acquaintance with him and appreciated his personal qualities:

It is with profound sorrow that we announce to you the death of our late partner, Jacob Born, which occurred at his residence in this city, on Friday, February 1st, at 2 o'clock p. m., of heart disease, at the age of 60 years.

The event, though sudden and unlooked for at the moment, was not altogether unexpected, as his health has been seriously impaired for a year past, and for some months a fatal termination to his disease was known to be only a question of time.

No one knew this better than he, and in consequence this business, which he had made his especial pride, and toward the success of which he had contributed so largely, will suffer no

change now that he has been called to the reward that awaits those who, like him, strive conscientiously to follow the path of duty.

With scarcely any advantages of education in his youth, Mr. Born gradually, step by step, worked his way up in the world, educating himself as he progressed, until he became regarded as one of the leading business men of this city, whose counsel was sought and opinion respected by all classes.

His life offers a conspicuous instance of what can be accomplished by application to business, perseverance, observation and strict integrity, when combined with ordinary economy.

In the hope that his example may be followed by many, we who have shared his counsels, and most keenly feel his loss, join in this tribute of respect to his memory.

Items.

Reading Hardware Company, Reading, Pa., announce that after a period of several months their new buildings are completed. Their new warehouse has been occupied since February 1, and the large iron foundry will be put in operation on or before March 1. They are now placing machinery in their new factory building, so that by March 20 they will be manufacturing goods therein, and state that by April 1 they will be in full operation and in better position to meet the wants of the trade than they were previous to the fire.

Joseph W. Wayne, 124 Main street, Cincinnati, Ohio, issues circulars relating to his varied line of Refrigerators, in which the different patterns are exhibited and the special features of their construction explained. In addition to the assortment of patterns for household use larger ones for the use of brewers, butchers, grocers, &c., as well as beer and wine coolers, are illustrated. He calls attention to the numerous improvements in the finish that have been made in the past few years, new patterns put on the market, &c.

It will be observed that among our special notices is one headed "An Unusual Opportunity," in which a well-established Hardware business is offered for sale. Particulars in regard to the location and the advantages of the opportunity, extent of stock, &c., are given as above.

Huber Mfg. Company, Philadelphia, Pa., issue a price list of the Arrow Brand Augers, Auger Bits, &c., manufactured by Dewitt, Morrison & Kelly. The special features of these goods are fully described, and emphasis is laid upon their quality. The different patterns are also illustrated, with the list prices. Circulars also in regard to the Hardware specialties of the company are inclosed.

Seavey Mfg. Company, 93, 95 and 97 North street, Boston, Mass., issue a convenient pamphlet showing a varied line of Deep Stamped, Retinned and Common Stamped Ware, Japanned, Planished, Coppered and Pieced Tin and Sheet Iron Ware, Registers, and Tinmen's and Kitchen Furnishing Goods. It is fully illustrated with small cuts, which, however, represent the goods satisfactorily, and the pamphlet (100 pages) is indexed throughout, facilitating reference to any desired line.

Chicago Stamping Company, Chicago, Ill., issue a 40-page illustrated circular of seasonable goods, including Freezers, Oil Stones, Challenge Refrigerators, Bird Cages, Water Coolers, &c., with a number of specialties. They issue another pamphlet which is devoted to Milk Cans and Dairy Supplies.

Fred. W. Shear has severed his connection with Bench & Shear, Skaneateles, N. Y., and purchased Mr. Nichol's interest in the firm of Nichols & Foote, Scranton, Pa., the name of the firm becoming Foote & Shear.

Hibbard, Spencer, Bartlett & Co., Chicago, Ill., are sending out two seasonable prices current which have evidently been prepared with especial care and relate

to a varied and interesting line of goods. One is their Fishing Tackle catalogue, January 29, No. 101, in which is exhibited an assortment of Fishing Rods, Reels, Fish Hooks, Trolling Baits, Bass and Trout Flies, and a variety of Fish Lines, including Lines in hanks, Block Lines, Coil Lines, &c. Casting Lines and Leaders, Sinkers, Landing Nets, Fly Books, Rowlocks, Rod Attachments, Mountings and other specialties are also illustrated. Incidental reference is made to Bicycles and Base-Ball Goods. The other price current is devoted to the Ashtabula Steel Goods, Hoes, Scythes, Curry Combs, Sheep Shears, Pruning Tools, Wheelbarrows, Lawn Mowers, Wire Netting, Barbed Wire and a variety of other goods, some of which are novelties adapted to the wants of the spring trade. In connection with these they also send out a price list of Victor Safes, with testimonials as to their fire-proof qualities.

J. B. Field & Co., Detroit, Mich., issue a circular describing the McMurchy Cleaner, which is a cleaner and lead remover combined. It is constructed so that it is self-adjusting to the surface of the inside of barrels from breech to muzzle, and the efficiency of its operation is alluded to.

E. I. Horsman, 80 and 82 William street, New York, issues a price list devoted to Tennis, Croquet, Base-Ball Supplies, Games, Home Amusements, Photographic Outfits, &c., in which are represented a number of novelties, together with well-known goods.

A circular is issued by Cordley & Hayes, 37 Barclay street, New York, general agents for Monroe Bros.' Patent Refrigerators, in which a detailed description is given of their No. 75 Fiber-Lined Refrigerator, with a cut showing its construction and a statement of the advantages possessed by it.

A new issue of the official classification applying to freights between the seaboard and Chicago or St. Louis went into effect 18th inst., and Hardware, which before was second class under all circumstances, is now made second class as before when shipped under owner's valuation; but when "value 5 cents per pound" is written on receipt it now takes third class. This arrangement will be to the advantage of the trade on the shipment of many heavy goods.

M. Mahony, Troy, N. Y., in connection with the Mahony Boilers, Heaters, Furnaces, &c., issues a pamphlet describing his line of Gas Sad Iron Heaters and Sad and Polishing Irons, &c. A variety of Heaters, Sad and Polishing Irons are thus exhibited.

Cordley & Hayes, 37 Barclay street, New York, announce that they have accepted the agency for the sale of the goods manufactured by the Amoskeag Indurated Fibre Company, Peterboro, N. H.

Julius Berbecker & Co., 65 Duane street, New York, in connection with their large line of Brass Goods, Upholsterers' and Cabinet Hardware, Scissors, Shears, &c., are putting on the market a large assortment of Upholsterers' Nails, the manufacture of which they control. This is a comparatively new branch of manufacture in this country, and the Nails thus offered to the trade are made by a new method, which is referred to as securing an excellent result in the quality of the goods at a moderate cost. The establishment on a successful basis of this line of manufacture as a new American industry is a matter for congratulation, and we understand that the manufacturers are in a position without difficulty to meet the prices of their foreign competitors, who have heretofore had the bulk

of the trade, and are, in fact, able also to export the goods to other countries. The catalogue, in which these Nails and a large variety of Upholstery Goods are illustrated, with list prices, is one of interest to the trade.

The Missouri Refrigerator Mfg. Company, St. Louis, Mo., have issued their catalogue for the present year, showing their line of Jewell Refrigerators. Besides the variety of family Refrigerators offered, it represents an assortment of Grocer, Upright, Butchers', Restaurant and Hotel Refrigerators, with which it is announced that they are prepared to furnish at short notice a line of Bar Fixtures, Beer Coolers, Counters, &c. It is stated that, in order to meet the demand for these goods, it has been necessary to more than double their manufacturing capacity and to add a large warehouse.

THE ANNUAL MEETING OF THE AMERICAN SCREW COMPANY

was held February 12, at the office of the company, Providence, R. I. From the report of William H. Henderson, the treasurer, who has occupied this position for 25 years, his connection with the company covering 30 years, it appears that the business of the corporation during that time has more than quadrupled. The number of personal accounts on its books has increased from about 850 in 1860 to 2700, the customers being now in every one of the United States. The total sales from the commencement of the business to December 31, 1888, amount to nearly \$53,000,000, and the total ascertained losses were only \$79,030, less than one-seventh of 1 per cent. of the sales. After a resolution in recognition of the long, faithful and able service rendered by Mr. Henderson as treasurer, it was moved that a testimonial of the company's appreciation be obtained and presented to him by the board of directors. From a synopsis of the report of the president, Edwin G. Angell, we make the following extract:

The report states that the Screws carried over are selling at a large advance over the prices of 1885. The sale of Wood Screws in 1888 was disappointing, partly because of the existence of stocks in jobbers' hands, purchased at extremely low prices. Consumption fell off somewhat, as usual in Presidential years, but stocks, old stocks, are reduced, and consumption has for some time been beyond production. In 1887, under the Screw Association, our sales were made beyond allotment, and we had to pay over to associates a very large sum in cash. In consequence our allotment was increased and we still have to pay, but not so much as formerly. It is doubtful whether such associations are beneficial in the long run. If the statistics made available by the association had been so before the extensive building of machinery brought about by the high prices of 1881 to 1883 inclusive, it is doubtful if we should have had to record the unremunerative business of 1885 to 1887. The demand for Wood Screws is limited, and cannot be enlarged at the will of inventors and capitalists. We have continued experiments in Swaging Screws, and feel warranted in building machinery which will, with what we now have, produce daily half as many Wood Screws as we produced daily last year. Rogers has improved on Harvey's discovery, securing an enlargement of four numbers of the Screw gauge with cheap material, where Harvey enlarged only two numbers, with costly Swedes iron. We have devised machinery also to produce a large head, which Harvey failed to do, which has proved very satisfactory, though at the outset it appeared impossible.

While we hope from the success thus far attained to employ the new processes to advantage in the future, you will understand that up to this time they have been a matter of expense rather than of profit, and therefore have not contributed to the profits of the past year. Those were the result of the business conducted without their aid. The general outlook for the present year is not for the moment favorable. Continued tariff discussion, overproduction of pig iron, growing accumulation of the stock of copper in the hands of the French syndicate, decline of railroad building, appear to affect unfavorably the minds of buyers, and thus far sales in 1889 have been light. The foreign Screw makers recently formed a Union and advanced prices greatly, and our chief competitor

abroad is reported to be making four or five times as many goods as we are. The establishment of a branch factory in Canada to supply this market if Congress reduced the duty upon screws without reference to raw material has proved to have been a blessing in disguise for us.

How to Sell Goods.

Prominent among the features of the Territorial Fair, lately held at Salt Lake City, Utah, were a number of special prizes offered for essays upon different subjects, the evident object being to bring out suggestions looking to the best means of attaining success in various lines of business. Mr. Spencer Clawson, a wholesale merchant, offered a prize of \$25 for the best essay on "How to Sell Goods," which prize was secured by Mr. B. F. Cummings, Jr. The subject treated is of such great interest to a large class among our readers that we give the essay in full herewith:

A moment's reflection will serve to show the infinite importance of this subject. It not only concerns the salesman and merchant, but every member of civilized society; for, as all members of civilized communities are compelled to purchase and consume merchandise, it follows that all are interested in the manner in which the merchandise they buy is sold.

Methods of selling goods may be pursued which are hurtful to the interests of merchant and customer alike, and which result in disappointment and injury to the latter, and a loss of custom and final failure to the former. Or the merchant may pursue a system which, while yielding an excellent profit to himself, will please, gratify and benefit his customers, make them feel that they can do better with him than elsewhere, and so secure their permanent patronage. How to avoid the results of one method and secure those of the other is comprised in the art of selling goods.

The process of selling the goods is intimately connected, indeed begins with, that of buying them; for, as the proverb has it, "Goods well bought are half sold." He, then, who would become a successful seller of goods must first learn how to buy them; and it is an open question among merchants which branch of their calling, buying or selling, requires the longer experience, the shrewder judgment, and the higher order of business ability. As the present purpose, however, is to treat of the methods to be pursued in selling goods, it will be assumed that the stock to be disposed of has been well bought, is suited to the wants of the community, and only awaits skillful and judicious handling by the salesman to yield satisfactory returns to the merchant.

MARKING THE GOODS.

One of the most important matters connected with the mercantile business is the marking of goods. In doing this, three objects should be kept in view: Profit to the merchant, ready sale, and satisfaction to the customer. This last object is often lost sight of, but we insist that a policy on the part of the salesman who does not aim at securing satisfaction to the customer is a short-sighted one, and will ultimately prove disastrous to the dealer. A customer will pay for a suit of clothes a price which will yield to the merchant a fair profit, and yet be content with his bargain; but were a sack of sugar marked to yield half as large a profit, a customer would feel that an attempt had been made to impose upon him. On some kinds of goods, then, customers will willingly allow the merchants a good profit, but others they will purchase only at a very small margin above cost.

It is the duty of the salesman to consider all the circumstances attendant upon this feature of his business, as the amount the capital invested ought to earn, the probable amount of the year's sales, the running expenses of the establishment, the kinds of goods handled, the competition to be met, the class of trade to be catered to, what will and will not satisfy his customers, &c. A volume could be written upon this one feature of mercantile business, but practical experience and native good judgment are the only means by which a salesman can become proficient in it.

Having considered every circumstance which ought to influence him in marking the goods, the salesman should make his prices and then adhere to them. A rumor that a house has two or more prices, according to the customer who is buying, will spread rapidly and soon create a distrust very hurtful to its business. It is unfair, undignified and downright dishonest to make different prices to different customers, other things being equal, such as quantity, time, &c. Uniform dealing one-price houses command a respect and confidence among customers which sliding scale dealers never enjoy.

Careful investigation has shown that in nearly all cases of bankrupt retail dealers a large proportion of the goods on their shelves were unmarked, and hence in a condition of confusion which could not but result in loss and disaster. The retail dealer who puts his goods on the shelves without marking them is tolerably certain to learn by bitter experience sooner or later the folly of his course; and the wholesale dealer who fails to keep a suitable record of prices as the market fluctuates is omitting a vital feature of success.

THE WHOLESALE SALESMAN.

Whether employed in the establishment or home or sent "out on the road" in the capacity of what is called a drummer, the first duty of the wholesale salesman is to make himself thoroughly and perfectly familiar with the entire stock of goods in the department or house in which he is employed. If an article is mentioned he should be able to state instantly whether or not it is in stock. It is of the utmost importance that he should be thoroughly posted on prices, and able to give from memory or his pocket price-book the price of any article the instant it is asked. He should be able to discriminate accurately between brands, grades, qualities, &c., and to explain differences between them to a customer.

Next to having a thorough knowledge of his own stock and business, it is important that the wholesale salesman should be familiar with those of his customer. He should know what kind of a business his customer is doing, what class of people patronize him, and what goods will be most popular among and best suited to the needs of that class. A wholesale salesman should not try to load up a retail dealer with goods not suited to the latter's trade. If this is done the retailer will meet with disappointment and loss, and in consequence of dead stock will be unable to meet his payments. Disgust at his own bad judgment will be mingled with distrust of the salesman who induced him to take the unsaleable goods, and he will thereafter buy elsewhere. Thus the retailer is injured and the wholesaler loses a good customer. All this may happen when the goods causing the trouble are really first-class and sold at a reasonable price; the difficulty lying in the fact that the wholesale salesman either did not know or did not regard what the real interests of his customer required.

All wholesale salesmen of experience understand perfectly well that, having once won the confidence and patronage of a retail dealer, he is influenced to a great extent by their advice and recommendations. It follows, then, that these should be offered intelligently and in the strictest good faith, with an earnest purpose on the part of the salesman to subserve the best interests of his customer. Their interests are identical. The more goods the retailer sells the more he will purchase from the wholesale house which has won his confidence. A bill of goods which is unprofitable for him to buy is unprofitable for the wholesale house to sell to him, and vice versa. In fact, a trunk and branch relationship exists between a wholesale house and the retailers whom it supplies, and the policy of the wholesale salesman should be to cement more and more closely that relationship, and strengthen the ties of confidence and friendship between the two, always having in view the interests of the buyer as well as those of his own house.

It is essential that the wholesale salesman should be thoroughly posted respecting the financial standing of his customer. Upon this point depends to a great extent his success in the art of selling goods. It requires little tact or ability to sell goods to a customer who is bent only on getting all he can on credit, without due consideration of the matter of making payment when due. It may, however, require considerable tact to properly treat a customer whose intentions are honorable, but whose resources, ability or experience are limited. If a buyer is known or suspected to be dishonest, sell to him for cash only. If necessary, tell him frankly that you do not know him to be a man whom you can afford to carry, and that your rule is to extend credit to those only whom you know you can depend upon. If your customer is worthy of credit up to a limit which, however, you do not wish to pass, avoid what, to a good salesman, is second nature, pushing goods upon him. Endeavor to furnish him with what he really needs, and to satisfy him, without going beyond the limit fixed for his credit. But should it be necessary, tell him plainly, but in a frank and friendly way, that at present you do not wish to carry him for more than a given amount. If he is a sensible man, he will take no offense, and if he is not a sensible man, it is unsafe for you to carry him on your books.

Selling goods by traveling salesmen with samples is expensive, but long experience has shown it to be the best method for wholesale dealers in many lines. The sample trunk, if properly prepared and packed, is the wholesale establishment in miniature. By its aid the country dealer is conducted through the big

store in the city, from the basement to the highest story, and is able to make selections as intelligently as if he had paid his fare to the city and was personally present in the establishment he is dealing with. The salesman should see that his sample trunk is complete, neatly and systematically arranged and that the samples correctly represent the stock. He should acquire facility in displaying them, in describing grades, qualities, &c., and in giving prices. The stationary or traveling wholesale salesman should keep complete price books, and post them as often as the prices vary. The memory should not be depended upon without their aid.

THE RETAIL SALESMAN.

Much of the foregoing applies to the retail salesman, especially in regard to familiarity with stock and prices and the giving of credit. He should be perfectly familiar with the goods he handles and with the prices at which they should be sold. If his employer deems it best to give him the "cost mark," as will generally be the case if he proves a good hand, so much the better. He should know exactly where to find any article called for. Time is money to buyer and seller alike, and the time lost by both while a clerk is hunting for some article for which a customer is waiting often amounts to a heavy percentage of its value. It is thus necessary for a retail clerk to be orderly and methodical to a strict degree in handling his stock. He must at once return to their places on shelves or in drawers, &c., the goods he has been showing a customer, and he must do this in such a manner as to preserve the stock in perfect order. A failure to keep the stock in order and the goods in their places and neatly arranged is probably the most common fault of the retail salesman. To avoid it he must put in the spare moments between customers in arranging shelves, drawers, showcases, &c., and in so displaying the goods as to cause them to appear new, fresh, varied and attractive. A retail salesman who can and will keep the goods arranged and displayed to the best advantage will command a high salary and will be a favorite with customers.

A very important auxiliary to the success of the retail salesman is the keeping up of his stock so as to avoid being out of any article. Vigilance and good judgment are required in ordering various lines as fast as they will be needed, but not fast enough to overstock.

The retail salesman, to be successful, must learn to read human nature. He must be able to perceive quickly the sort of person he is dealing with, and to form an accurate judgment as to what sort of an article, and about what price will be likely to suit the customer. Scarcely one customer in ten who enters a store to purchase an article knows in advance exactly what he wants; and it is the province of the clerk to aid him in coming to a conclusion. The art of doing this may be acquired to a great degree of perfection, though not without long practice and experience; and, when acquired, it adds immensely to the value of the services of the salesman possessing it.

QUALITIES NECESSARY IN ALL SALESMEN.

Be industrious; exert yourself actively to show goods to customers and to find what will suit them.

Be patient; preserve perfect equanimity, even though your customer appears trifling, fastidious, or exacting. Sincere efforts on your part to please him will win in the long run.

Be polite; under no circumstances speak to or treat a customer with impoliteness. To do so is to make a mistake inexcusable in a salesman. Your politeness to customers is money to your employer, and is one of the considerations for which you are paid a salary.

Be considerate of poverty; do not try to sell a poor person a more expensive article than he can afford to buy. By so doing you may wound his feelings, and cause him to avoid you in future. Rather try to suit him with an article within his means. If you succeed he will try you again.

Be attentive to small purchasers; if a lady wishes only a spool of silk, and you politely furnish her with the shade desired, she will come to you when she has a larger purchase to make.

Be truthful; never resort to deception in representing the quality of the goods you sell. Truthfulness is in a salesman a virtue which will soon begin to tell in a pecuniary as well as a moral way, for people will flock to the clerk whose word they know they can depend upon respecting the value they are getting for their money.

Be honest; not merely because honesty is the best policy, but because without it life is a failure, though wealth flow in to the amount of millions, and the world lavish its honors and applause. The most hopeless and contemptible of bankrupts is the man who has lost his honesty; and the most useless of all employees—the one who is most expensive while least worthy of a salary, who is most to be avoided by customers and abhorred by merchants—is the dishonest salesman.

Arrangement of Stores.

The Gunn Hardware Company is a flourishing institution of Grand Rapids, Mich. It was founded by W. S. Gunn, who for many years conducted a retail Hardware store in that city, and about three years ago concluded that he would go into the jobbing business. The connection with the retail trade was continued, and a separate building was erected for the wholesale department

with a large, dry and light basement. It was built with the most careful consideration as to the use to which every part of it was to be applied. The basement floor was made thoroughly waterproof by being covered with a layer of cement and crushed stone a foot deep, into which the joists for the floor were laid before it hardened, thus forming a solid support for the heavy goods intended to be stored there. Two rows of inside posts, of iron, were erected the whole length of the building, arranged

a portable shute which enters the basement window. A large elevator runs from the basement to the top floor. The offices, which are handsomely fitted up, are on the second floor, in the front of the building. The remainder of this floor is used for a sample-room. Racks and cases are used according to the character of the goods. Samples of small wares are fastened on long racks extending almost the whole length of the room, the frames of which are A-shaped. Green billiard cloth is

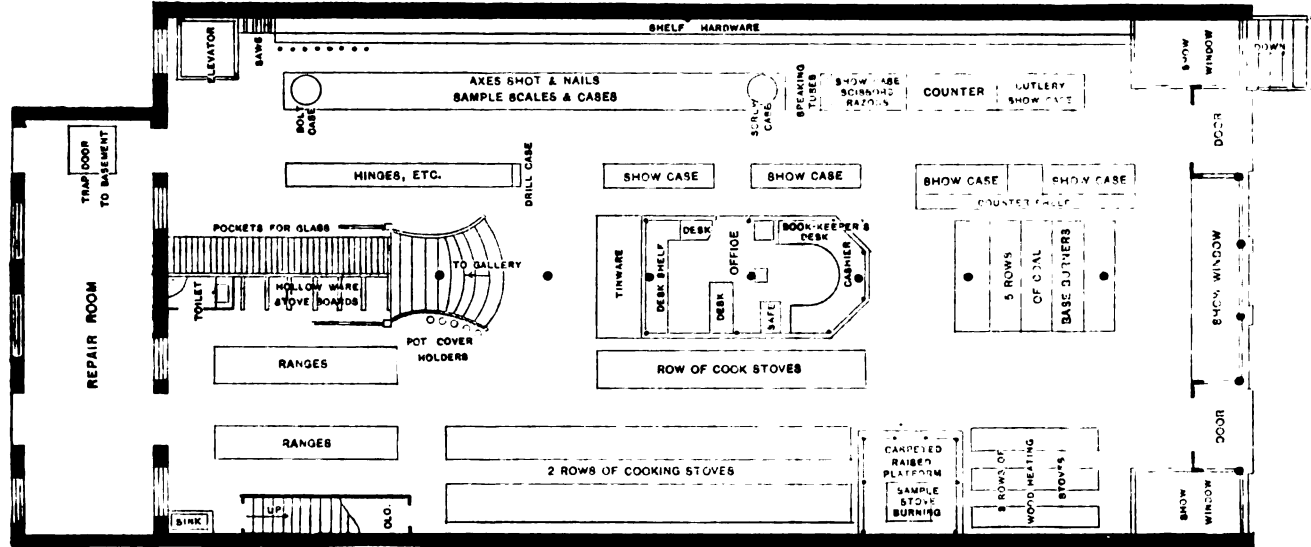


Fig. 308.—Gunn Hardware Company.—Arrangement of Store.

about five blocks distant. The retail store is located at 47 and 49 Monroe street and the wholesale store at 5 and 7 South Ionia street. Shortly after opening the wholesale department Mr. Gunn decided that it would be best for the perpetuity of the business to organize a stock company to conduct it, and the Gunn Hardware Company is the result, of which

14 feet from the sides of the building. The joists were thus of short length, so that they would not sag under the heavy load which they were intended to carry. The windows were also set in front and rear so as to line with the shelving and thus give sufficient light to the center of the stock rooms. The first floor, which is 18 feet high, is used for an iron and steel store,

fastened on the sides of the racks as a background for the goods. This cloth is used, notwithstanding its cost, because it not only makes the display more attractive, but also because goods tacked on it do not rust easily, the cloth background absorbing all dampness. The upper floors are used for stock rooms and packing. Shelving in the stock rooms extends to the ceiling,

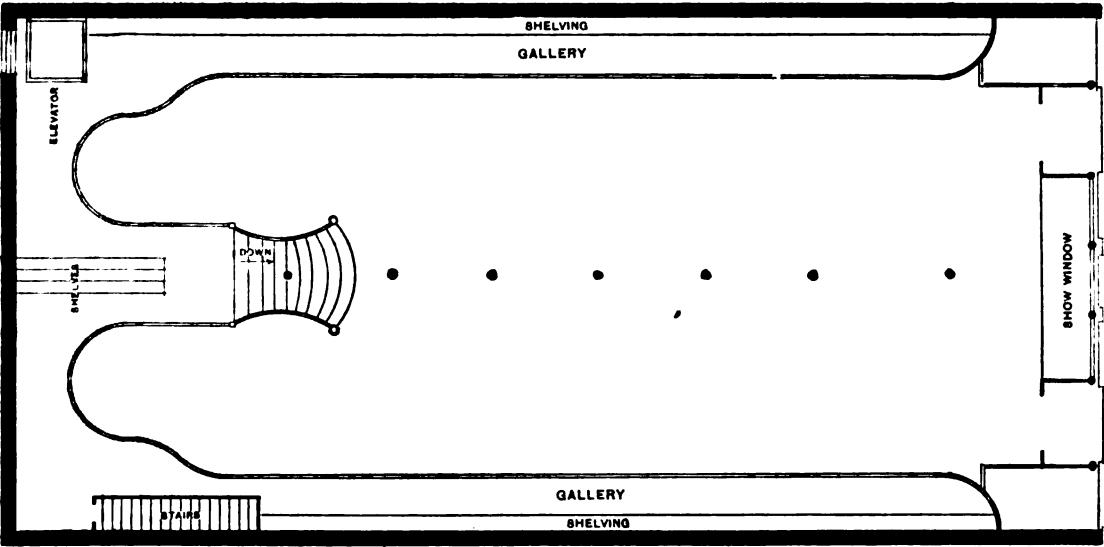


Fig. 309.—Arrangement of Gallery.

Edwin F. Uhl, a prominent capitalist, is president, W. S. Gunn is vice-president and manager, Wm. A. Gunn is treasurer, F. W. Berles is a director and A. S. Goodman is secretary. The enlarged operations of the concern have been attended with remarkable success, which is due very largely to the business sagacity and enterprise of W. S. Gunn, who continues to give the business his earnest personal attention. The arrangement of the company's two stores is worthy of detailed description.

The wholesale house occupies a lot 50 feet by 100 feet and is five stories high,

the stock standing on end in racks extending lengthwise through the building, to bring the weight on the posts and heavy girders. This floor is on an exact level with the floor of a car on a siding of the Grand Rapids and Indiana Railroad, which extends along the rear. Space sufficient for a wagon to pass is left between the railroad track and the building. This space is roofed over to protect teams, workmen and goods from rain. Goods are transferred between the store and the cars over heavy planks, but anything intended for the basement is delivered into

but as the ceilings of these rooms are comparatively low little use is made of step-ladders. Rows of shelving extend down the centers of the stock rooms over the heavy girders running between the posts. The neatness with which these rooms are kept is very striking. Every room is connected with the office by a speaking tube, while the telephone is brought into requisition in communicating with the retail house. Surplus stock is stored in three other warehouses, one of which is 50 feet by 200 feet, one story high, with galleries round it, located on the Michigan Central

Railroad, and the others, which are smaller, are along the Grand Rapids and Indiana. In them are stored Nails, Galvanized Iron, Barb Wire and other bulky articles. The lines carried by this house embrace Heavy Hardware, Nails, Stoves, Chains, all kinds of Shelf Hardware, Revolvers and Ammunition, and a large number of Hardware specialties, such as Scales, Churns, &c. They import their Tin Plate direct from Wales.

The retail store, which in all respects but ownership is entirely distinct from the

space 5 x 19 feet, and the corner windows with a front of 6½ feet and a depth of 12½ feet. The goods displayed in these windows are frequently changed, so as to secure variety, and among the displays a line of Heating Stoves may be mentioned, the most showy one having a gas-pipe conducted into it for the purpose of burning gas at night to attract attention. The large, deep windows on either side are inclosed in plate glass on three sides, the fourth side being the wall, which is covered with green billiard cloth. These side

attention is given to the arrangement of these windows to secure efficiency and attractiveness of the display, and they constitute an interesting and important feature in the arrangement of the store.

It will be observed that the cashier's desk and offices are in the center of the store, so as to be within easy reach of the salesmen. They are lighted by a skylight overhead. As indicated in Fig. 808, one side of the store is devoted to Stoves and House-Furnishing Goods and the other side to Hardware, the space being thus about equally divided. The ceiling is 14 feet high, permitting the erection of a gallery around three sides of the store, so as to add materially to the capacity of the salesroom. This gallery, which is shown in Fig. 809, is reached by a broad flight of stairs in the rear of the store. It is 4½ feet wide, and is placed just midway between the floor and ceiling. Shelves extend along the walls, while an ornamental railing is used for displaying goods of various kinds. A one-story addition, 40 x 13 feet, has been built in the rear for use as a porter's room. In it goods are received, Stoves are polished and all kinds of rough work done which would litter up the store. A shop not shown in the illustration is connected with the store, in which tinning, plumbing, gas-fitting and cornice-making are carried on. The floors and stairs of the store are made of red oak, while the counters and showcases are of cherry.

Passing to a more detailed description of the different features of the arrangement, it is to be observed that the shelving on the right-hand side of the store under the gallery, with the exception of two sections, is filled with boxes, the fronts of which are covered with green billiard cloth, each box having samples on front of the goods contained within. One of these boxes is shown in Fig. 811. The goods on this side of the store are divided between the nine sections as follows:

Section 1. Shutter Bars, Sash Fasts, Sash Lifts, Sash Pulleys, Locks and Knobs, &c.

Section 2. Eagle Locks and Locks and Knobs.

Section 3. Padlocks, Door Butts, Locks and Knobs, Keys.

Section 4. Coat and Hat and Wardrobe Hooks, Door Latches and Pulls, Base Knobs, Door Plates, Chest Handles, Measuring Tapes, Cupboard Catches, Window Springs, &c.

Section 5. Shutter Knobs, Upholsterers' Nails, Molasses Gates, Pulleys, Snaps, Bull Rings, Ox Balls, Wrought Iron Goods, Saw Sets, Plane Irons, Dividers, &c.

Section 6. Curtain Rings, Ferrules, Bright Wire Goods, Sash Rollers, Gate Hinges and Latches, Screw-Drivers, Wrenches, Picture Knobs, Nails and Hooks, Foot Scrapers, Spring Hinges, Hog Rings and Rings, &c.

Section 7. Chalk and Masons' Lines, Screws in gross packages, Cartridges, &c., and the following goods in tin boxes, the fronts painted green: Tacks in papers and bulk, Wire Nails and Brads, Blued, Brass and Nickel-Plated Screws, &c.

Section 8. Carpet Stretchers, Nail Pullers, Box Scrapers, Oilers, Chisel and other Handles, Shelf Brackets, &c.

Section 9. In wooden boxes, fronts painted green: Tobacco Boxes, Match Safes, Stove Bolts, Rivets and Carriage Bolts not in Bolt case.

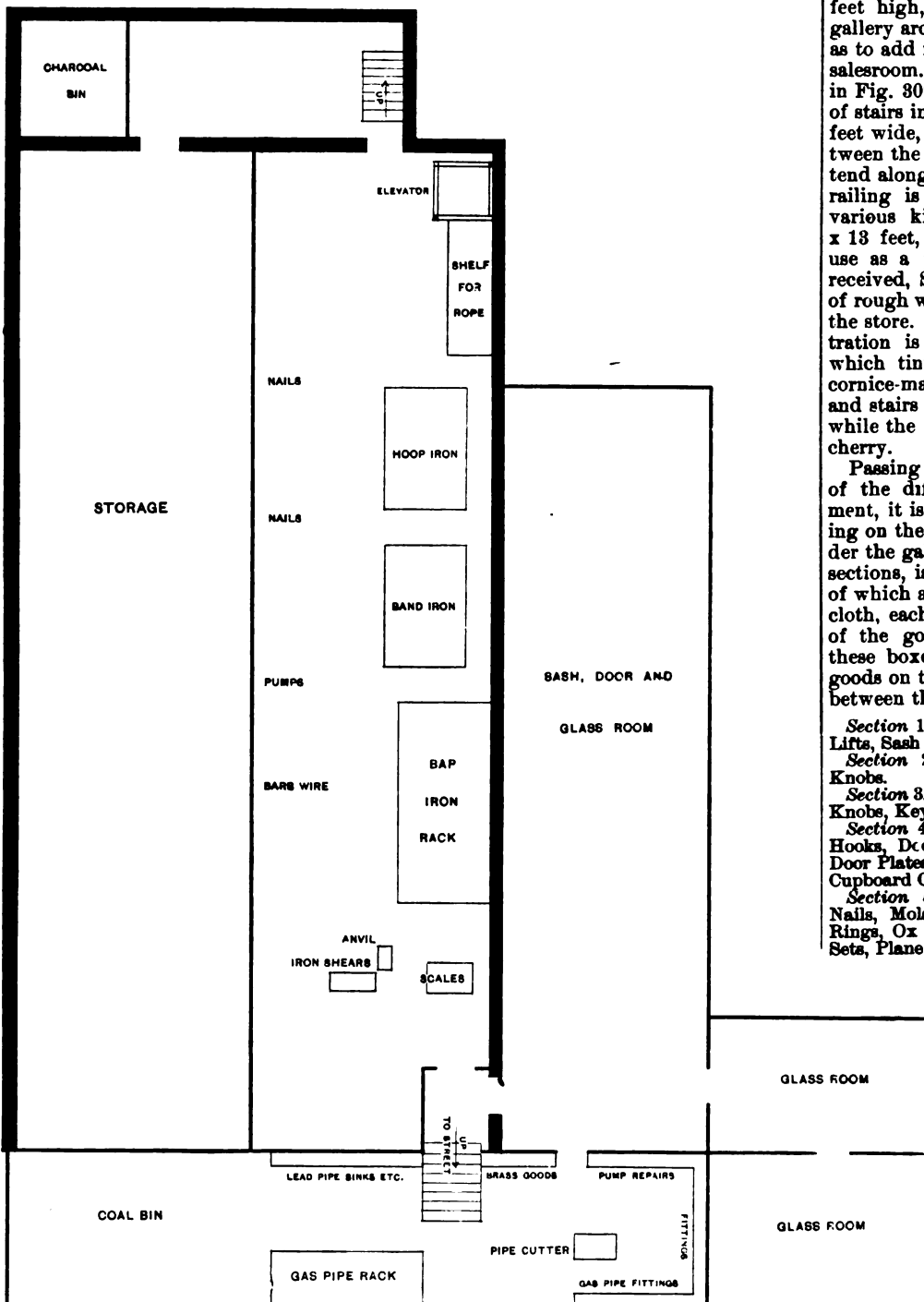


Fig. 810.—Diagram of Basement.

wholesale store, occupies a lot on Monroe street, 44 x 113 feet. Its general arrangement is represented in the accompanying illustrations, Figs. 808, 809 and 810. Not only is the storeroom a double store, but several lofts also are used in connection with it besides the basement under it and under two adjoining stores, as shown in Fig. 810. The arrangement of the store floor is given in the diagram Fig. 808. In this it will be seen that large and attractive show windows are secured, the center windows have a front of 19 feet and floor

windows are carpeted, while the middle one is covered with oil cloth. The window on the left of the entrance is furnished with plate glass shelves supported by brackets, the shelves being filled with Britannia, Granite and Decorated Pearl Agate Ware, Tea and Coffee Pots, &c., the floor being occupied with a variety of Japanned Ware, Coal Vases, &c. The window on the opposite side is devoted to a display of Hardware, of which a large variety of Tools and miscellaneous goods are exhibited. A good deal of care and

The Cutlery showcase near the front of the store on this side is devoted to Pocket Cutlery. The bottom of the showcase is covered with red cloth and has an arrangement covered with green billiard cloth for a display of Pocket Cutlery in the center of the case, as shown in Fig. 312. This showcase is 8 feet long, 2 feet wide, 10½ inches high at front and 11½ inches high at back, inside measurement. The oval boards on which the Pocket Knives are placed are of the following sizes: The lower board 12 inches wide, 20 inches

long and 1½ inches high, the upper board being 6 inches wide, 12 inches long and 1½ inches high. The lower round boards are 16 inches in diameter and 1½ inches in

315 give front and rear views of counter near the front of the store, which is devoted to Tools, while a novel and striking arrangement of other goods is secured on

it will be seen that it is furnished with doors, one of which is shown open, disclosing six compartments for Saws, each 8 x 10 inches. The different sizes of Hand-Saws are thus accommodated, there being separate compartments for each size, with a slip pasted above giving the length of the Saw, its number and the number of teeth to the inch. The space, 13 inches wide the full length of the counter, serves a useful purpose in selecting goods. The showcases on top front the other way, as show in Fig. 314, on one of the prominent aisles of the store. The front of this counter and its two sides have green billiard cloth tacked on them, covering the whole space. Small moldings running vertically 10 inches apart divide this space into panels, in which are fastened samples of various kinds, arranged with a view to ornamentation. Thus samples of Chalk are attached to represent the number of the store, while other goods form stars and other decorative designs.

The fronts of the small drawers—Fig. 311—in which Shelf Hardware is kept, are all covered, as above stated, with green billiard cloth, on which samples are fastened. They are naturally attached in different ways, according to the style of goods to be sampled. For instance, Locks are fastened with round head nickel-plated Screws through the key-holes. Strikes are put on with Screws, and Keys are hung on No. 81 ¾-inch Sargent's Brass Coat Hooks. Knobs are fastened by two links of brass Jack Chain, one end of which is put through screw-holes in the Rose, while the other ends are hung on No. 81 ¾-inch Hooks. Padlocks are hung on No. 81 1-inch Hooks, and other goods are put on with Screws. No. 110 Screw Hooks, Blind Staples, Double-Pointed Tacks, &c., are used, according to the style of the goods. All Japanned Goods that have surfaces suitable have the numbers marked on them with gold ink. Brass Goods are marked with black ink, while others hav-

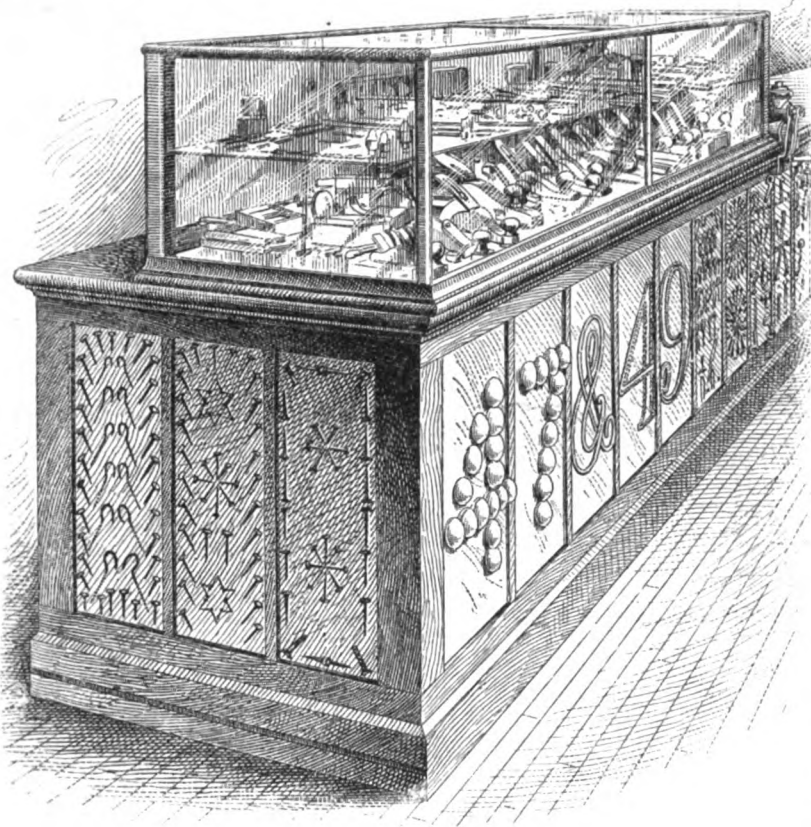


Fig. 314.—Front of Tool Counter.

high, the upper board being 8 inches in diameter and 1½ inches high. They are covered, as noted above, with green billiard cloth. Pocket Knives are arranged on these boards so as to secure an effective display. The number and prices are marked on the blade of each. They are marked in ink after having been given a coat of shellac varnish covering surface enough for the marks. This prevents the ink from rusting the blades. Other showcases used in the store are 2 feet wide and 18 inches high and have glass shelves about midway between the bottom and top. One of them is filled on the bottom with full assortments of Nicholson's Fancy Files, Oil Stones and Slips; the shelves being used for samples of Auger Bits, Twist Drills, Augers, Hollow Augers, &c. Table Cutlery and miscellaneous Knives, Rules and Revolvers occupy another case, the shelf being devoted to a variety of related lines.

The space under the balcony on the right-hand side toward the rear is occupied, as indicated in Fig. 308, by a Glass rack, which contains over 200 sizes. On the opposite side are bins containing Hollow-Ware, Dripping Pans, Fire Shovels, Shovels and Tongs, Maslin Kettles, Stove Boards, &c. On the floor near the gallery stairway are six open-top cans, Fig. 313, which are used for holding Pot Covers, and are made to fit the different-sized Covers. These Cover holders are 27½ inches high, and have an opening 2½ inches wide running from the top to within 6 inches of the bottom, and are made large enough so that the following sizes of Covers will drop in easily, namely: 9½, 9¾, 10½, 10¾, 11½ and 12 inch. Sample boards on the front of the balcony railing are covered with green cloth, and are filled with a variety of goods such as an extensive assortment of Butts, Bolts, Door Locks, Knobs, &c., complete Bronze and Bronzed Store Door Handles, Latches and Locks, Sash Fasts, Letter-Box Plates, Electric Bell Pushes, &c. Figs. 314 and

the outside, with a very convenient arrangement for carrying a stock of Saws inside. This counter or Saw case is 19 feet long, 40 inches in extreme breadth, and

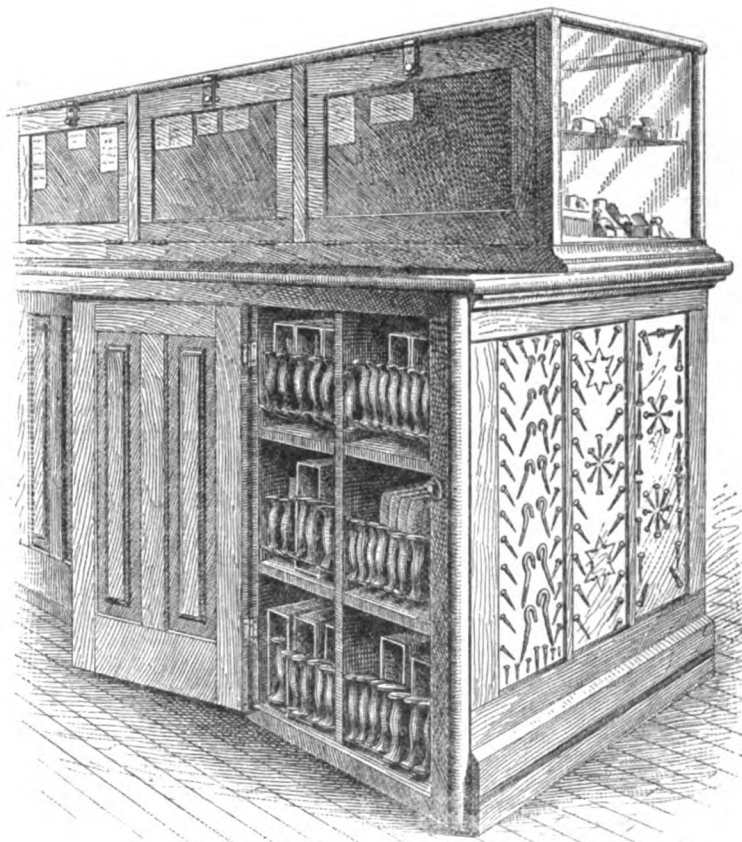


Fig. 315.—Rear of Tool Counter, Showing Saw Case.

3 feet to top of counter. Two showcases occupy the top, 18 feet long, 27 inches wide and 16 inches high. In Fig. 315 the rear of this counter is shown, from which

ing no surface suitable are marked on green tags tacked near them. Prices are marked on the right-hand side of drawers and boxes.

It will be seen by Fig. 311 that each drawer and box has a Washer $\frac{1}{2}$ inch outside diameter. This Washer is painted white on one side and red on the other, and is hung on a small wire hook on the upper right-hand corner of the front. When the red side is out it indicates that the drawer or box has inside some of the goods sampled, and when the white side

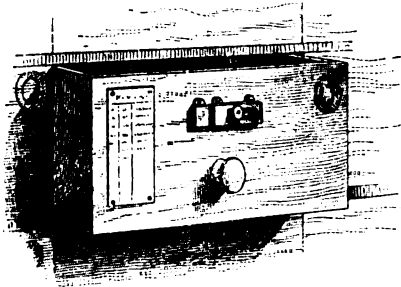


Fig. 311.—Shelf Box.

is out it shows that the stock is exhausted and needs replenishing.

The counter, Fig. 316, near the stairway to the gallery, contains bins which hold Barn Door Hangers, Strap and T Hinges, Machine Bolts, Crosscut Saw Handles, Solder and Soldering Coppers, Chain Links, Screw Hook and Strap Hinges, &c.

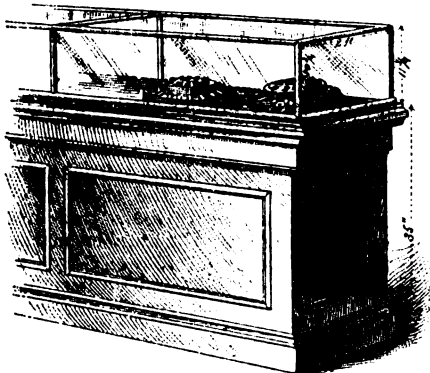


Fig. 312.—Counter and Cutlery Show Case.

On the top of this counter are piled Horse Nails, Toe Calks, Bench Vises, Heavy Hammers, Clothes-Line Reels, &c. On the rack above are Shovels, Spades, Scoops, Snow Shovels, Steel Goods, Post-Hole Diggers, &c. A Drill case occupies the end.

Axes are sampled as shown in Fig. 317 on a board 2 feet wide by 3 feet long, which lies lengthwise on the counter with one

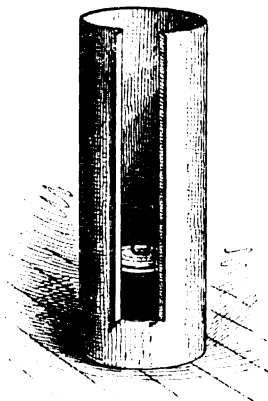


Fig. 313.—Pot Cover Case.

end elevated about 6 inches higher than the other. It has a strip nailed across it for the edge of the Axes to rest against, the whole being covered with green billiard cloth.

A feature of this store, which is most striking upon entrance, is the extent to

which sampling is carried. Even the large drawers in which heavy Tools are kept have a sample fastened on them, thus producing a pleasant effect, from the large variety of goods that is thus brought to view, and resulting doubtless in increased

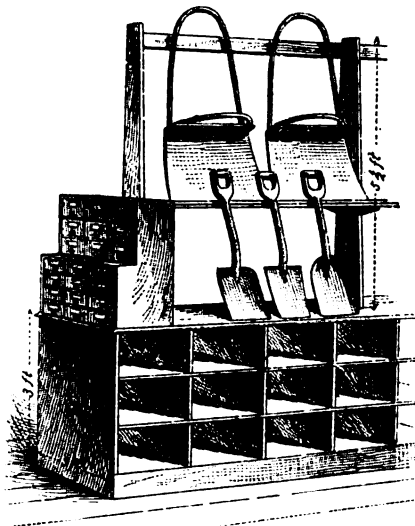


Fig. 316.—Counter, Steel Goods Rack, &c.

business, as customers are enabled to select without difficulty such articles as they may be in need of.

Space occupied in winter by base-burning coal Stoves will soon be filled with Gasoline Stoves, Refrigerators, Ice-Cream Freezers, Water Coolers, Filters, &c., and other seasonable goods arranged on tables, while the room now occupied by wood heating and platform and sample Stoves will be occupied by a Tinware stand now at the rear of office, together with other goods now stored upstairs. The rack for Steel Goods will then take the place of the Tinware stand. By removing other

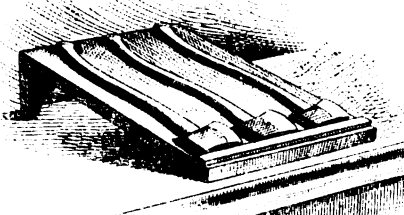


Fig. 317.—Sample of Axes.

Stoves space will be secured for Tubs, Pails, Churns, Washboards, &c.

In addition to the room shown on the diagram the company have on the second floor their Tinshop, and on the third floor they store light bulky goods, such as Shovels, Spades, Scoops, Steel Goods, Baskets, Bellows, Step-Ladders, Clothes Bars, Tubs, Pails, Tinware, Wheelbarrows, &c.

Exports.

PER BARK ALBERT RUSSELL, FEBRUARY 7, 1889, FOR BRISBANE, AUSTRALIA.

By E. T. Hopkins.—3 Stoves and 1 box of Parts for same.

By Welsh & Lea.—14 cases Iron Bolts, 1 case Carpet Sweepers.

By Collins Company.—128 dozen Axes, 3 dozen Bush Hooks, 40 dozen Hatchets.

By A. Field & Co.—2 dozen Handles, 3 dozen Spoons, 60 Stoves.

By R. W. Forbes & Son.—1 case Lampware.

By B. F. Avery & Sons.—25 packages Plow Parts.

By Lazarus & Rosenfeld.—8 cases Slates, 1 case Hammers, 8 packages Axes, 15 packages Clothes Pins, 40 boxes Axes.

By V. Basanta.—20,000 Ammunition, 40 dozen Washboards, 40 dozen Hatchets, 37 dozen Saws, 9 sets Harness, 65 dozen Washboards, 4 gross Blacking, 12 Scales, 6 dozen Awls and Haft, 18 dozen Cow Bells.

By Coombs, Crosby & Eddy.—2 $\frac{1}{2}$ dozen Saws, 30 dozen Edge Tools, 12 dozen Axes, 4 dozen Carpenters' Tools, 12 Stepladders, 1 dozen Railroad Barrows, &c.; 3 $\frac{1}{2}$ dozen Agricultural Tools, 1-24 gross House-Furnishing Goods.

By R. W. Cameron & Co.—3 Stoves and 1 box Parts for same, 12 dozen Axes, 12 dozen Picks, 6 dozen Saws, 12 dozen Stoves, 36 dozen Hoes, 32 dozen Axes, &c., 3141 pounds Axes, 500 Broom Handles, 3 cases Grindstones, 12 dozen Washboards, 10 boxes Clothes Pins, 4 dozen Tubs and Pails, 12 dozen Hammers, 1200 pounds Nails, 1 dozen Handles, 1 case Guns.

By H. W. Peabody & Co.—3 cases Carriage-Ware, 2500 feet Hose, 12 cases Axes, 5 cases Hardware, 1 case Lampware, 3 cases Hardware, 1 case Agricultural Implements, 1 $\frac{1}{2}$ gross Axle Grease, 36 dozen Handles, 2 cases Picks, 2 cases Lampware, 1 bundle Pumps, 27 packages Hardware.

By A. S. Lascelles & Co.—3 cases Grease, 8 cases Tacks, 1 case Nails, 15 dozen Braces, 17 cases Handles, $\frac{1}{2}$ dozen Scales, 3 cases Hardware, 1 gross Locks, 100 Boxes Clothes Pins, 35 bundles Washboards, 2 cases Hardware, 2 dozen Braces, 1 bundle Brooms, 400 pounds Oil Stoves, 3 Stoves, 20 Oil Stoves, 6 dozen Lemon Squeezers, 16 dozen Axes, 3 dozen Picks, 3 cases Hardware, 6 dozen Axes, 48 dozen Hatchets, 5 cases Hardware.

By Arkell & Douglas.—15 boxes Hardware, 21 cases Handles, 267 dozen Axes, 154 dozen Hatchets, 840 dozen Handles, 1 case Saws, 4 packages Hardware, 100 boxes Clothes Pins, $\frac{1}{2}$ dozen Braces, 11 Trucks, 1 crate Sifters, 10 cases Hardware, 2 gross Axle Grease, 23 dozen Hammers, 100 pounds Oil Stoves, 1 case Air Guns, 6 gross Shade Rollers, $\frac{1}{2}$ dozen Paint Mills, $\frac{1}{2}$ dozen Wringers, 2 cases Bench Screws, 1 gross Blacking, 4 cases Choppers, 1 dozen Scales, 5 cases Hardware, 2 packages Bolts, $\frac{1}{2}$ barrel Blocks, 3 cases Lamp Goods, $\frac{1}{2}$ dozen Ladders, 29 cases Hardware, 100 pounds Nails, 1 crate Wheels, 1 $\frac{1}{2}$ dozen Churns, 1 barrel Hose, 1 box Door Checks, 1 case Upsetters, 10 cases Hardware, 10 cases Agricultural Implements, 5 packages Hardware, 219 gross Wicks, 3 cases Tools, 6 dozen Traps, 34 packages Carriage-Ware, 50 boxes Clothes Pins, 12 cases Clocks, 1 case Tinware.

PER BARK GAERWEN, FEBRUARY 7, 1889, FOR EAST LONDON.

By New Home Sewing Machine Company.—48 Hand Machines.

By W. H. Crossman & Bro.—57 cases Plow Parts, 60 cases Plow Parts.

By Coombs, Crosby & Eddy.—148 Plows and Parts, 2200 pounds Nails, 1 dozen Meat Cutters, 7 dozen Axes, 24 dozen Axe Handles, 6 Road Scrapers, 17 dozen Axes, 120 dozen Carpenters' Tools, 29 pounds Sash Cord, 7 dozen Sash Fasteners, 1520 pounds Sash Weights, 3 Sand Stones.

FOR DELAGOA BAY.

24 Plows, 50 dozen Edge Tools, 30 dozen Brooms, 22 dozen Pick and Axe Handles, 6 dozen Saws, 12 dozen Hammers, 4 dozen Clocks, 5 dozen Handled Axes, 6 Scales, 13 pounds Sash Cord, 4 dozen Sash Fasteners, 950 pounds Sash Weights.

PER BRIG GEORGIE, FEBRUARY 13, 1889, FOR PORT ELIZABETH, SOUTH AFRICA.

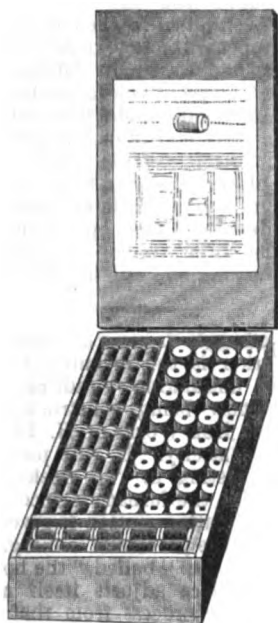
By Arkell & Douglass.—21 cases Plows, 25 cases Agricultural Implements, 16 dozen Picks, 80 dozen Handles, 150 dozen Brooms, 93 kegs Nails, 61 cases Axes, 10 dozen Wrenches, 3 dozen Saws, 240 Broom Handles, 10 boxes Clothes Pins, 6 dozen Washboards, 10 boxes Clothes Pins, 60 dozen Brooms, 20 dozen Handles, 4 cases Hardware, 6 dozen Hammers, 16 Plows, 1 dozen Sewing Machines, 3 cases Scales, 1 case Plow Wings, 8 dozen Hammers, 16 pounds Sash Cord, 1 dozen Churns, 1 dozen Sewing Machines, 1-6 dozen Washers, 1-6 dozen Mangles, 24 kegs Nails, 10 boxes Sash Weights, 40 pounds Sash Cord.

By Corner Bros. & Co.—2 cases Agricultural Implements, 1 case Sash Cord.

A. J. Jordan, of Sheffield and St. Louis, manufacturer of fine Cutlery, reports a steadily increasing business. His trade in Razors is assuming large proportions, and he informs us that his AAA1 Razor, or what is commonly known as Triple A1, is steadily growing in favor, and, in fact, has become one of his leaders. The policy he has followed in the manufacture of this Razor is to make it a first-class article, and by the use of the best steel and careful workmanship he says he has built up quite a reputation for it, the result of which is that he is daily in receipt of mail orders for this specialty.

Spooled Wire.

Malin & Co., Cleveland, Ohio, the well-known manufacturers of spooled wire, have lately introduced an article to the trade which they call "A Retail Stock of Spooled Wire." It is represented in the accom-



Retail Stock of Spooled Wire.

panying illustration. It consists of a box containing 147 spools of wire, the box being tastefully painted, furnished with hinged cover and partitioned off to hold the various sized spools. This enables the retailer to carry a small and well assorted stock of brass, copper and annealed and tinned steel wires, varying in gauge from No. 18 to No. 34. The contents of the case are assorted according to the extensive experience of the manufacturers, who probably are in a better position to judge on this point than retailers who have not handled the goods. It is obvious that the wire thus put up in assorted cases has the well-known advantages possessed by their spooled wire, being easy to handle, not liable to tangle, &c. The outer layer of the wire on the spool is coated with shellac, preventing it from rusting or tarnishing, and all spools containing a quarter pound or more are stamped with the number of feet on the spool in addition to the gauge of the wire.

The Chicago Horseshoe Company.

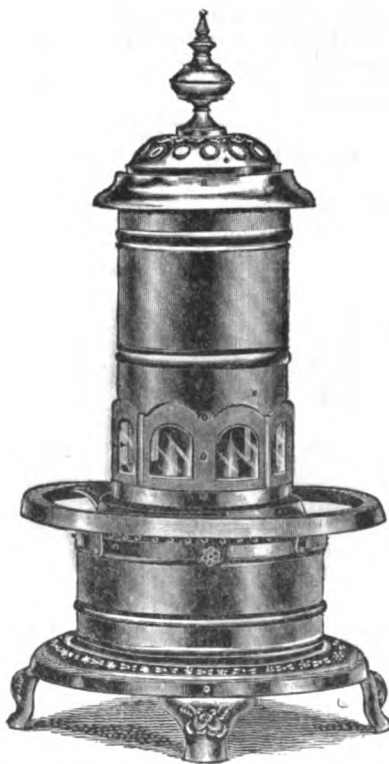
A complete plant is now being erected for the manufacture of horseshoes at East Chicago, Ind., by the Chicago Horseshoe Company, whose main office is in room 535, Rookery Building, Chicago. The officers of the company are as follows: Geo. W. McCook, president; Edward L. Lamb, general manager; Zenas Burns, secretary and treasurer. The plant will consist of a rolling mill and a combination of special horseshoe machinery capable of turning out from 1000 to 2000 kegs of horseshoes daily, with facilities for the enlargement of the productive capacity of the works as the trade secured may warrant. The rolling mill will contain one 22-inch train of rolls and one 12-inch train, with two furnaces to prepare the material for them. Scrap will be the principal material used, embracing both iron and steel. For a special class of shoes it is intended to use combined iron and steel under the Wheeler patents. The product of the works will be shoes of standard patterns, the officers of the company believing that it is well to avoid the

costly and unsatisfactory experience of those who have attempted to make innovations in the forms of horseshoes. They base their hope of building up a profitable business on the character of their machinery, which they believe will enable them to manufacture shoes much cheaper than can be done with other machines.

The machinery is the invention of a man who has had 20 years' practical experience in the manufacture of horseshoes, and those who are interested in the company speak most enthusiastically of its capabilities. A description of it has not yet been made public, but it is asserted that it operates somewhat like the combination of stamps used in dressing ores, so that additions to its capacity are easily made. Each section of the machine is expected to make a finished shoe in four seconds, punched, swedged, concaved and ready for the market. In punching the shoes a wheel or cylinder will be used which is 8 feet in diameter, having punches protruding from its periphery, and as it revolves over the shoes the holes are made with perfect exactness in the proper places. The rapidity with which the product is turned out and the completion of the entire work by machinery are relied upon to reduce the cost of manufacturing shoes. The vicinity of Chicago was selected for the location of these works partly because of its facilities for distributing the product over a very large section of the country and partly because the materials to be used can be had at lower prices than at any other good manufacturing point. The building now being erected for the works will be 700 feet long by 80 feet wide. The construction of the machinery is well under way, and the company expect to be in operation within 90 days.

The Grand Oil Heater.

The A. F. Shapleigh Hardware Company, St. Louis, Mo., are offering to the trade the heating stove for burning oil



The Grand Oil Heater.

which is known under the name of Grand, and represented in the accompanying illustration. It is constructed of sheet iron, has ample mica illumination and is provided with a foot rail, which encircles the base.

The company allude especially to its heating qualities, and the small expense at which it can be run.

New Arctic Ice-Cream Freezer.

The accompanying illustration represents a freezer put on the market by the White Mountain Freezer Company, Nashua, N. H., with branch office 99 Chambers street, New York. It has been put on the market to meet the demand for a low-priced freezer, which would at the same time be of fair quality. It will be observed that the gearing is completely cov-



Arctic Ice Cream Freezer.

ered, so as to prevent anything from getting between the cogs. The tub is bound with galvanized-iron hoops, and constructed with a view of obtaining the desired result with the smallest possible quantity of ice. The can is described as made of the best quality of charcoal tin plate, with cast-iron top and bottom nicely galvanized. Special emphasis is laid on the hinged top, which is also detachable, a feature which is alluded to as not found in other freezers. The gear frame can be tipped back from the edge of the tub, as shown in the cut, allowing the can to be removed or contents examined, or it can be entirely removed if desired. Special attention is called by the manufacturers to the low price at which this freezer is offered, and they also call attention to its quality.

The following figures convey some idea of what it will cost to light the Paris Exhibition: It is estimated that 900 hours of service will be required, and on this basis the following prices have been adopted: For each glow lamp of 16 candle-power, 60 francs; 10 candle-power, 45 francs; for each arc light of 500 candle-power, 500 francs; 1000 candle-power, 750 francs. The motive power will be furnished at the following rates: Up to 500 horse-power-hours, 50 cents per horse-power-hour, and beyond 500 horse-power-hours, 40 cents per horse-power-hour. The total illuminating power of electric lamps is estimated at 1,600,000 candles; and the number and types of lamps at present decided upon are as follows: Jablochkoff candles, 128; arc lamps, 1017; glow lamps, 9080; sun lamps, 16.

Bicycle Padlocks.

The illustration herewith given represents one-third size an arrangement for securing bicycles, tricycles, &c., which is manufactured by the Ames Sword Com-

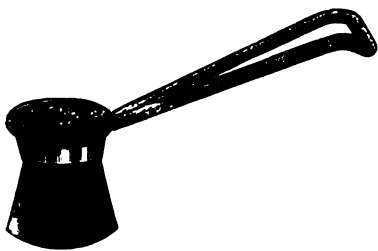


Bicycle Padlock, One-Third Size.

pany, Chicopee, Mass. The 1-inch padlock has eight levers, two keys, and the chain is 12 inches long. The locks are described as worked with a double-bitted key, as shown, which turns indefinitely both ways, so that they are not liable to get out of order or be picked. The chain is furnished either in brass or nickel-plated. The elegance of the workmanship and the beauty, lightness and strength of the article, together with the low price at which it is offered, are the points made in regard to it. It will be observed that there is a clevis drop fastened through the center of the padlock, which turns easily upon it.

The Sunshine Dauber.

The illustration given below represents the Sunshine dauber, which is put on the market by the Thompson Mfg. Company, Lansingburg, N. Y., and replaces their former pattern of coil handle dauber, which they have discontinued making. The special points in regard to this dauber are that the handle is of such a shape as to secure convenience in operation and prevent the knuckles from coming in contact with the shoe, and that the brush part is a solid knot of bristles. The knot is also alluded to as the right size and shape to spread the blacking on the part of the shoe to be polished without daubing the uppers. The quantity of bristles in each brush is referred to as sufficient, if doubled in the middle and drawn into a common shallow wooden block, to make



The Sunshine Dauber.

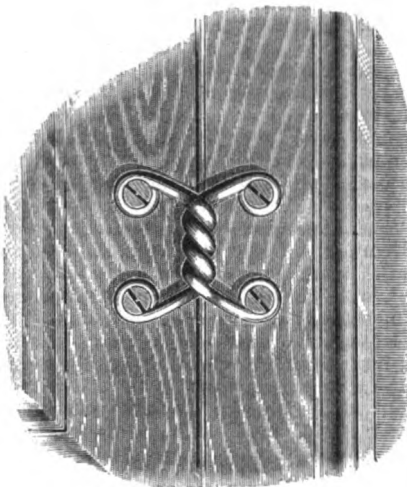
two old style brushes and some bristles over. The brush is further described as waterproof, and the bristles can be washed and dried again without injury. The knot also is somewhat larger than in their former coil handle pattern. The durability of the dauber and the low price at which it is offered are further points made in regard to it.

It is announced that the strike of the workmen employed in the limestone quarries in the Mahoning Valley, Ohio, which has been in progress for several weeks, is broken, the men employed at two of the quarries having returned to work at the old wages, while the places of those who refused to return to work have been filled

with new men. A majority of the men were opposed to striking, but were persuaded by the leaders. Several blast furnaces were compelled to bank.

The Perkins Hinge.

This hinge is made under a patent, January 1, 1889, and is manufactured by the New Haven Wire Goods Company, New Haven, Conn. It is designed more especially for use as a cheap hinge for crates, boxes, &c., rather than for doors, although it can be used to some advantage for this purpose. It is pointed out that, unlike

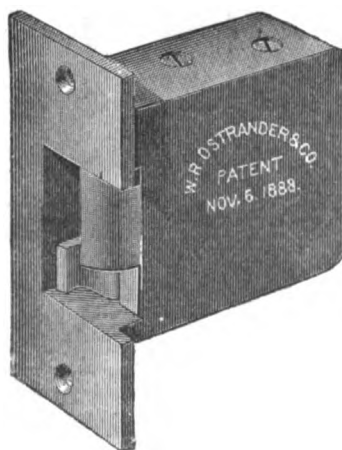


The Perkins Hinge.

cast hinges, this hinge will not break, while it can be produced at a lower cost than others. A variety of sizes will be furnished suitable for light or heavy work. The hinges are made automatically from steel wire. The reasonable figures at which they are offered and their special adaptation to the purposes for which they are intended are alluded to, and it is thought by the manufacturers that, as it is a decided improvement over the cast or wrought hinges now in use, it will readily find a prominent place in the market for such goods.

The Ostrander Door Opener.

This door opener, patented November 6, 1888, and manufactured by W. R. Ostrander & Co., 21, 23 and 25 Ann street,



The Ostrander Door Opener.

New York, embodies some new features, and is illustrated in the accompanying engraving. It is so constructed as to be operated either by compressed air through a pneumatic tube or by electricity with batteries. The manufacturers call atten-

tion to the fact that the movement in a gravity one, and that it is devoid of any delicate springs or delicate mechanism, so that it is not liable to get out of order. It is protected by metal sides to prevent dirt, plaster or chips from interfering with its operation. The movable bolt shown in the cut is a steel drop forging, and the other parts are described as made of the best wrought iron and steel. Especial care has been taken in the construction of the door opener, so as to make it of requisite quality and secure its satisfactory operation. The point is also made that it is positive in operation, and withstands wind and other force and cannot be jarred open. Its mechanism also is such that the opening of the door is not interfered with by pressure upon it, as in the case of other similar devices. The operation of this article has been tested in practical use since the patent was applied for.

A Pittsburgh ironworker named Anthony Barker is the inventor of what he terms an undulating puddling furnace, which is now being constructed at the Kensington Iron Works of H. Lloyd, Son & Co., in that city. It will probably be ready for testing in two weeks. As its name implies, the furnace is so constructed that an undulating motion is given to the iron during the process of boiling. When a heat is to be "balled," the bottom of the new furnace adjusts itself automatically, and the process from that out differs but little from the present method of puddling. The inventor claims that the first cost will only be a little over that of the old style, while it will turn out at least double the weight of iron with one more man. The Barker Undulating Furnace Company, Limited, with a capital of \$20,000, have been incorporated to push the new furnace. Their officers are: A. W. Tyler, chairman; H. Lloyd, Son & Co., general managers; Jeremiah Miller, vice-chairman; James B. Booth, secretary; A. G. Holmes, treasurer, and Anthony Barker, general manager.

Bids for the construction of a submarine torpedo-boat were opened at Washington on Friday. The Columbian Iron Works, of Baltimore, offered to build a vessel of 90 tons under three bids, as follows: \$150,000, guaranteeing a speed of 12 knots on the surface and 9 knots submerged, with 19 hours' power endurance on the surface and one hour submerged; \$115,000, guaranteeing 10 knots on the surface and 8 hours submerged and 15 hours' endurance on the surface, and \$100,000, guaranteeing nine hours on the surface and seven hours submerged. George C. Baker, of Des Moines, Iowa, offered to construct a vessel of 40 tons, with no guarantees except that she could be handled easily either on the surface or submerged.

The financial troubles which have overtaken the Ohio and Western Iron Company form a topic for remark by Western correspondents. A writer at Columbus, Ohio, says a strange fatality has been connected with the property out of which the Ohio and Western grew. James T. Burkey, who committed suicide in a St. Louis hotel, was harassed to the last by thoughts of the fortunes he had lost among the Hocking hills. George Lee, who killed himself in a New York hotel, was haunted in his dying hour by the specter of ruin in the coal fields of Ohio. Royal M. Pulsifer, the founder of the Boston *Herald*, took his own life some months ago, and, though he had many other business complications to pull him down, he, too, had sought the fabled pot of gold that was said to be buried at the foot of the Western rainbow.

CURRENT HARDWARE PRICES.

FEBRUARY 20, 1889.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers' name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers, at the figures named.

Ammunition.—

Caps, Percussion, "1000—	
Hicks & Goldmark's	
F. L. Waterproof, 1-10's	50¢
E. B. Trimmied Edge, 1-10's	55¢
E. B. Grad. Edge, Cent. Fire, 25 & 1-10's	70¢
Double Waterproof, 1-10's	1.40
Musket Waterproof, 1-10's	50¢
G. D.	25¢
S. B.	30¢

Union Metallic Cartridge Co.	
P. C. Trimmied	50¢
P. L. Ground	25¢
Cent. Fire Ground	25¢
Dbl. Waterproof	1.40
Dbl. Waterproof, in 1-10's	1.40
S. B. Genuine Imp.orted	45¢
Eley's E. B.	54¢
Eley's D. Waterproof, Central Fire	1.10

Cartridges.	
Rim Fire Cartridges	50¢
Rim Fire Military	15¢
Cent. Fire, Pistol and Rifle	25¢
Cent. Fire, Military and Sporting	15¢
Blank Cartridges, except 22 and 32 cal., additional 10% on above discounts.	2¢
Blank Cartridges, 22 cal., 1.75	2¢
Blank Cartridges, 32 cal., 1.50	2¢
Primed Shells and Bullets	1.50
B. B. Caps, Round Ball, 1.75	2¢
B. B. Caps, Con. Ball, Swgd., 2.00	2¢

Primers—	
Berdan Primers, 1.00	2¢
B. L. Caps (for Sturtevant Shells) 1.00	2¢
All other Primers, 1.20	2¢

Shells—	
First quality, 4, 8, 10 and 12 gauge	25¢
First quality, 14, 16 and 20 gauge (10 list)	30¢
Star, Club, Rival and Climax brands, 10 and 12 gauge	35¢
Club, Rival and Climax brands, 14, 16 and 20 gauge	30¢
Seibold's Comb. Shot Shells	1.50
Brass Shot Shells, 1st quality	60¢
Brass Shot Shells, Club, Rival, Climax	65¢
I. X. L., 10 and 12 gauge	40¢
"Special" 16 gauge	30¢
"Special" 10 and 12 gauge	40¢
Fowler's Pat.	3.25

Shells Loaded—	
A. M. Co. List No. 19, 1887	20¢

Wads—	
U. M. C. & W. R. A.—B. E., 11 up	2.30
U. M. C. & W. R. A.—B. E., 9 & 10	2.30
U. M. C. & W. R. A.—B. E., 7 & 8	2.30
U. M. C. & W. R. A.—P. E., 11 up	3.10
U. M. C. & W. R. A.—P. E., 9 & 10	4.00
U. M. C. & W. R. A.—P. E., 7 & 8	4.00
Eley's B. E., 11 up	1.75
Eley's P. E., 11 up	2.30

Anvils.—	
Eagle Anvil, 10¢	20¢
Peter Wright's	10¢
Armstrong's Mouse Hole	94¢
Armstrong's Mouse Hole, Extra 11	1.10
Trenton	94¢
Wilkinson's	94¢
J. & Riley Cast. Pat. Solid	1.10
Moore & Barnes Mfg. Co.	33¢

Anvil Vise and Drill—	
Milner Falls Co., 1.10	20¢
Cheney Anvil and Vise	25¢
Allen Anvil and Vise	3.00, dis 40¢

Apple Parers—	
Advance	50¢
Antrim Combination	50¢
Baldwin	50¢
Champion	50¢
Eureka, 1888	17.00
Family Bay State	50¢
Gem	50¢
Gold Medal	50¢
Hudson's New '88	3.75
Ideal	4.75
Improved Bay State	30.00
Little Star	5.00
Monarch	13.50
New Lightning	5.00
Orion	4.00
Penn.	4.00
Perfection	4.00
Pomona	4.00
Rocking Table	6.00
Turntable	4.00
Victor	13.50
Waverly	4.50
White Mountain	4.50
72	4.25
76	4.25
78	6.50

Augers and Bits—

Douglas Mfg. Co.	
Wm. A. Ives & Co.	
Humphreysville Mfg. Co.	70¢
French, Swift & Co. (F. H. Beecher)	
Cook's, Douglas Mfg. Co.	55¢
Cook's, N. H. Copper Co.	50¢
Ives' Circular Lip	60¢
Patent Solid Head	30¢
C. E. Jennings & Co., No. 10, extension	40¢
C. E. Jennings & Co., No. 30	60¢
3 1/4 quarters, No. 5, 25; No. 30, 33	20¢
Lewis' Patent Single Twist	45¢
Jennings' Augers and Bits	25¢
Imitation Jennings' Bits	60¢
Pugh's Black	20¢
Car Bits	50¢
L. Hommedieu Car Bits	15¢
Forster Pat. Auger Bits	10¢

Hollow Augers—

Ives'	25¢
French, Swift & Co.	25¢
Douglas	25¢
Bonney's Adjustable, 7 dos 48	40¢
Stearns	20¢
Ives' Expansive, each \$4.50	50¢
Universal Expansive, each \$4.50	20¢
Wood's	25¢

Expansive Bits—

Clark's small, 18; large, 25	35¢
Ives' No. 4, 7 dos 30	40¢
Swan's	40¢
Stearns, No. 1, 25; No. 2, 22	40¢
Stearns' No. 2, 48	20¢

Gimlet Bits—

Common	7 dos \$2.75; 25¢
Diamond	7 dos \$1.10
"Bee"	25¢
Double Cut, Shephardson's	45¢
Double Cut, Ct. Valley Mfg. Co.	30¢
Double Cut, Hartwell's, 7 gro.	40¢
Double Cut, Douglas	40¢
Double Cut, Ives	60¢

Bit Stock Drills—

Morse Twist Drills	50¢
Standard	50¢
Cleveland	50¢
Syracuse, for metal	50¢
Syracuse, for wood (wood list)	30¢
Williams' or Holt's, for metal	50¢
Williams' or Holt's, for wood	40¢

Ship Augers and Bits—

L'Hommiedieu's	15¢
Watrous'	15¢
Snell's	15¢
Snell's Ship Auger Pat'n Car Bits	15¢

Awl Hafts—

Sewing, Brass Fer. 7 gr. \$3.50	45¢
Pat. Sewing, Short, 1.00	40¢
Pat. Sewing, Long	40¢
Pat. Peg, Plain Top, 7 gr. \$10.00	45¢
Pat. Peg, Leather Top, 7 gr. \$12.00	45¢

Awls, Brad Sets, &c—

Awls, Sewing, Common 7 gr. \$1.70	35¢
Awls, Should. Peg, 7 gr. \$2.45	40¢
Awls, Pat. Peg, 7 gr. \$3.50	40¢
Awls, Shouldered Brad, 2.70 7 gr.	30¢
Awls, Handled Scratch, 7 gr. \$7.50	35¢
Awls, Socket Scratch, 7 dos, \$1.50	25¢

Awl and Tool Sets—

Alken's Sets, Awls and Tools	
No. 20, 7 dos \$10.00	55¢
Fraser's Adj. Tool Hds., Nos. 1, 12; 2, 18; 3, 15; 4, 20	25¢
Miller's Falls Adj. Tool Hds.	
No. 1, 12; 2, 18	25¢
Henry's Combination Haft	25¢
Brad Sets	
No. 42, \$10.50; No. 43, \$12.50	70¢
Stanley's Excelsior	
No. 1, \$7.50; No. 2, \$4.00; No. 3, \$5.50	30¢

Axes—

Makers' and Special Brands—	
First quality	7 dos \$5.00; 65¢
Others	7 dos \$5.50; 65¢

Axle Grease—

Fraser's	Reg 7 1/2, Pall 7 1/2 net
Fraser's, in boxes	7 1/2 net
Dixon's Everlasting, in bxs	7 1/2 net
Dixon's Everlasting, 10-b pails, ea. 85¢	7 1/2 net
Lower grades, special brands	7 1/2 net

Axles—

No. 1	4¢
Nos. 2 to 12	5¢
Nos. 10 to 22	60¢
National Tubular Self-Oiling Standard	
Farm (1 to 5) and Special Farm (1 to 15)	
Less than 10 sets	33¢
Over 10 sets	33¢

Bag Holders—

Sprengle's Pat.	7 dos \$18
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Balances—

Spring Balances	50¢
Common 24-lb	60¢
Chatillon's Spring Balances	50¢
Chatillon's Circular Spring Balances	60¢

Bells—

Hand—	
Light Brass	70¢
Extra Heavy	80¢
White Metal	60¢
Stiver Chime	33¢
Globe (Cone's Patent)	25¢

Door—

Gong, Abbe's	33¢
Gong, Yankee	45¢
Gong, Barton's	40¢
Crank, Taylor's	25¢
Crank, Brooks	50¢
Crank, Cone's	10¢

Crank, Connel's	20¢
Lever, Sargent's	60¢
Lever, Taylor's Bronzed or Plated	net
Lever, Taylor's Japanned	25¢
Lever, R. E. M. Co's	50¢
Pull, Brook's	50¢
Pull, Western	25¢

Cow—

Common Wrought	60¢
Western	20¢
Western, Sargent's list	70¢
Kentucky, "Star"	20¢
Kentucky, Sargent's list	70¢
Kentucky, Genuine Kentucky	70¢
Texas Star	50¢
Call	40¢
Farm Bells	7 1/2
Steel Alloy Church and School Bells	40¢

Bellows—

Blacksmith's	50¢
Molders	40¢
Hand Bellows	40¢

Belting, Rubber—

Common Standard	70¢
Standard	70¢
Extra	80¢
N. Y. B. & P. Co., Carbon	60¢
N. Y. B. & P. Co., Diamond	50¢

Bench Staps—

Morrill's	7 dos \$9
Weston's, No. 1, \$10; No. 2, \$9.25	10¢
McGill's	7 dos \$8

Bits—

Auger, Gimlet, Bit Stock, Drills, &c., see Augers and Bits.	
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Bit Holders—

Extension, Barber's, 7 dos \$15.00	40¢
Extension, Ives, 7 dos \$30.00	60¢
Diagonal	7 dos \$24.00
Angular	7 dos \$24.00

Blind Adjusters—

Domestic	7 dos \$3.00, dis 35¢
Excelsior	7 dos \$10.00
Washburn's Self-Locking	20¢

Blind Fasteners—

MacKrell's	7 dos, \$1.00
Van Sand's Old Pat.	\$15.00 7 gr.
Van Sand's Old Pat.	\$15.00 7 gr.
Washburn's Old Pattern	\$3.00 7 gr net
Merriman's	new list, net
Austin & Eddy No. 2008	\$9.00 7 gr net
Security Gravity	\$9.00 7 gr net

Blind Staples—

Barbed, 1/4 in. and larger	7 1/2
Barbed, 3/4 in.	8 1/2

Blocks—

Cleveland Block Co., Mal. Iron	50¢
Moore's Novelty, Mal. Iron	50¢

Belts—

Door and Shutter—	
Cast Iron Barrel, Square, &c.	70¢
Cast Iron Shutter Bolts	70¢
Cast Iron Chain (Sargent's list)	65¢
Cast Iron Door Bolts	60¢
Wrought Barrel	70¢
Wrought Square	70¢
Wrt. Shutter, all Iron, Stanley's	60¢
Wrt. Shutter, Brass Knob	40¢
Wrt. Shutter, Sargent's list	60¢
Wrt. Sunk Flush, Sargent's list	55¢
Wrt. Sunk Flush, Stanley's list	50¢
Wrt. B.K. Flush, Com'n	55¢

Carriage, Machine, &c.—	
Com. list June 10, '84	75¢
Genuine Eagle, list Oct., '84	75¢
Phila. pattern, list Oct. 7, '84	75¢

R.B. & W., old list	70¢
Machine, according to size	75¢
Bolt Ends, according to size	75¢

Tire—

Common, list Feb. 28, '83	70¢
P.C. & N. Co.	
Empire, list Feb. 28, '83	70¢
Phila., list Oct. '84	82¢
Keystone, Philadel., list Oct. '84	80¢
Norway, Phila., list Oct. '84	75¢
Am.S. Co.	
Norway, Phila., list Oct. 16, '84	75¢
Eagle, Phila., list Oct. 16, '84	80¢
Philadel., list Oct. 16, '84	82¢
Bay State, list Feb. 28, '83	70¢
R.B. & W., Philadel., list Oct. 16, '84	82¢
R. & E. Mfg. Co.	70¢

Stove and Flow—

Stove	62¢
Plov	60¢
Am. S. Co. Stove, Annealed	62¢
R. B. & W., Plov	55¢
R. B. & W., Stove	62¢
R. & E. Mfg. Co., Stove	62¢

Berax—

Without	7 1/2
Augers, Upright, Angular	
Douglas	\$5.50
Snell's, Rice's Pat.	5.50
Jennings	5.50
Other Mchals	2.35
Phillips' Patent	2.75
with Augers	7.00

Boring Machines—

Without	
Augers, Upright, Angular	
Douglas	\$5.50
Snell's, Rice's Pat.	5.50
Jennings	5.50
Other Mchals	2.35
Phillips' Patent	2.75
with Augers	7.00

Bow Pins—

Humason, Beckley & Co's	60¢
Sargent & Co's	17 and 18
Peck, Stow & W. Co.	50¢

Braces—

Barber's	
Nos. 10 to 18.	50¢
Nos. 20 to 33.	50¢
Nos. 40 to 63.	50¢
Barker's	
Nos. 8, 10 and 12.	75¢
Plated, Nos. 8, 10 and 12.	65¢
Osgood's Ratchet.	40¢
Spooford's	50¢
Ives' New Haven Novelty.	70¢
New Haven Ratchet.	60¢
Barber Ratchet.	60¢
Barber's	60¢
Spooford	60¢
Common Ball, American.	\$1.10
Bartholomew's,	
Nos. 25, 27 and 30.	50¢
Nos. 37, 118, 119.	70¢
Amidon's	
Barker's Imp'd Plain.	75¢
Barker's Imp. Nickle'd.	65¢
Ratchet.	75¢
Eclipse Ratchet.	60¢
Globe Jawed.	40¢
Universal, 8 in.	40¢
Universal, 8 in., \$2.10; 10 in.	\$2.30
Buffalo Ball.	\$1.10
P. S. & W.	50¢

Cards—
Horse & Curry.....10¢10¢10¢10¢
Cotton.....New Est. Aug. 1888.
10¢10¢10¢
Wool.....New Est. Aug. 1888.
10¢10¢10¢

Carpet Stretchers—
Cast Iron, Polished.....\$ doz \$2.25
Cast Iron, Steel Points.....\$ doz \$0.40
Socket.....\$ doz \$1.75
Bullard's.....25¢25¢10¢

Carpet Sweepers—
Bissell No. 5.....\$ doz \$17.00
Bissell No. 7 New Drop Pan.....\$ doz \$19.00
Bissell, Grand.....\$ doz \$26.00
Grand Rapids.....\$ doz \$24.00
Crown Jewel, No. 1, \$18.00; No. 2,
\$19.00; No. 3, \$20.00
Magic.....\$ doz \$15.00
Jewel.....\$ doz \$17.00
Improved Parlor Queen, Nickel
\$ doz \$27.00
Improved Parlor Queen, Japaned
\$ doz \$24.00

Excelsior.....\$ doz \$23.00
Garland.....\$ doz \$15.00
Parlor Queen.....\$ doz \$15.00
Housewife's Delight.....\$ doz \$15.00
Queen.....\$ doz \$15.00
Queen, with band.....\$ doz \$15.00
King.....\$ doz \$15.00
Weed, Improved.....\$ doz \$15.00
Hub.....\$ doz \$15.00
Cog-Wheel.....\$ doz \$15.00
Conqueror.....\$ doz \$15.00
Easy.....\$ doz \$15.00
Monarch.....\$ doz \$15.00
Goshen.....\$ doz \$15.00
Advance.....\$ doz \$15.00
Ladies' Friend, No. 1, \$15.00;
No. 2, \$16.00
American.....\$ doz \$15.00
Grand Republic.....\$ doz \$15.00

Cartridges—
See Ammunition.

Casters—
Bed.....New list:
Shallow Socket.....\$55¢55¢55¢
Deep Socket.....\$60¢60¢60¢
Yale Casters, list May, 1888.....\$30¢10¢40¢
Yale, Gem.....\$60¢60¢55¢
Marden's Patent (Phoenix).....\$45¢10¢60¢
Payson's Anti-friction.....\$60¢60¢10¢
"Giant" Truck Casters.....\$10¢10¢5¢
Stationary Truck Casters.....\$45¢10¢

Cattle Leaders—
Humason, Beckley & Co.'s.....70¢
Sargent's.....60¢10¢
Hutchins.....90¢
Peck, Stow & W. Co.....50¢10¢

Chain—
Trace, 6 1/2-10-3, exact,
\$ pair, \$1.03.....50¢10¢50¢10¢5¢
Trace, 6 1/2-10-3, exact,
\$ pair \$2.50.....50¢10¢50¢10¢5¢
Trace, 7-10-2, exact,
\$ pair \$1.11.....50¢10¢50¢10¢5¢
NOTE.—Traces, "Regular" sizes, \$2 net
\$ pair less than exact.
Log, Fifth Stretcher, and other fancy
Chains, list Nov. 1, 1888

American Coll. in oak lots,
3-16 1/4 5-16 3/4 7-16 1/2 9-16 3/4 11-16 1/2 13-16 3/4 15-16 1/2 17-16 3/4 19-16 1/2 21-16 3/4 23-16 1/2 25-16 3/4 27-16 1/2 29-16 3/4 31-16 1/2 33-16 3/4 35-16 1/2 37-16 3/4 39-16 1/2 41-16 3/4 43-16 1/2 45-16 3/4 47-16 1/2 49-16 3/4 51-16 1/2 53-16 3/4 55-16 1/2 57-16 3/4 59-16 1/2 61-16 3/4 63-16 1/2 65-16 3/4 67-16 1/2 69-16 3/4 71-16 1/2 73-16 3/4 75-16 1/2 77-16 3/4 79-16 1/2 81-16 3/4 83-16 1/2 85-16 3/4 87-16 1/2 89-16 3/4 91-16 1/2 93-16 3/4 95-16 1/2 97-16 3/4 99-16 1/2 101-16 3/4 103-16 1/2 105-16 3/4 107-16 1/2 109-16 3/4 111-16 1/2 113-16 3/4 115-16 1/2 117-16 3/4 119-16 1/2 121-16 3/4 123-16 1/2 125-16 3/4 127-16 1/2 129-16 3/4 131-16 1/2 133-16 3/4 135-16 1/2 137-16 3/4 139-16 1/2 141-16 3/4 143-16 1/2 145-16 3/4 147-16 1/2 149-16 3/4 151-16 1/2 153-16 3/4 155-16 1/2 157-16 3/4 159-16 1/2 161-16 3/4 163-16 1/2 165-16 3/4 167-16 1/2 169-16 3/4 171-16 1/2 173-16 3/4 175-16 1/2 177-16 3/4 179-16 1/2 181-16 3/4 183-16 1/2 185-16 3/4 187-16 1/2 189-16 3/4 191-16 1/2 193-16 3/4 195-16 1/2 197-16 3/4 199-16 1/2 201-16 3/4 203-16 1/2 205-16 3/4 207-16 1/2 209-16 3/4 211-16 1/2 213-16 3/4 215-16 1/2 217-16 3/4 219-16 1/2 221-16 3/4 223-16 1/2 225-16 3/4 227-16 1/2 229-16 3/4 231-16 1/2 233-16 3/4 235-16 1/2 237-16 3/4 239-16 1/2 241-16 3/4 243-16 1/2 245-16 3/4 247-16 1/2 249-16 3/4 251-16 1/2 253-16 3/4 255-16 1/2 257-16 3/4 259-16 1/2 261-16 3/4 263-16 1/2 265-16 3/4 267-16 1/2 269-16 3/4 271-16 1/2 273-16 3/4 275-16 1/2 277-16 3/4 279-16 1/2 281-16 3/4 283-16 1/2 285-16 3/4 287-16 1/2 289-16 3/4 291-16 1/2 293-16 3/4 295-16 1/2 297-16 3/4 299-16 1/2 301-16 3/4 303-16 1/2 305-16 3/4 307-16 1/2 309-16 3/4 311-16 1/2 313-16 3/4 315-16 1/2 317-16 3/4 319-16 1/2 321-16 3/4 323-16 1/2 325-16 3/4 327-16 1/2 329-16 3/4 331-16 1/2 333-16 3/4 335-16 1/2 337-16 3/4 339-16 1/2 341-16 3/4 343-16 1/2 345-16 3/4 347-16 1/2 349-16 3/4 351-16 1/2 353-16 3/4 355-16 1/2 357-16 3/4 359-16 1/2 361-16 3/4 363-16 1/2 365-16 3/4 367-16 1/2 369-16 3/4 371-16 1/2 373-16 3/4 375-16 1/2 377-16 3/4 379-16 1/2 381-16 3/4 383-16 1/2 385-16 3/4 387-16 1/2 389-16 3/4 391-16 1/2 393-16 3/4 395-16 1/2 397-16 3/4 399-16 1/2 401-16 3/4 403-16 1/2 405-16 3/4 407-16 1/2 409-16 3/4 411-16 1/2 413-16 3/4 415-16 1/2 417-16 3/4 419-16 1/2 421-16 3/4 423-16 1/2 425-16 3/4 427-16 1/2 429-16 3/4 431-16 1/2 433-16 3/4 435-16 1/2 437-16 3/4 439-16 1/2 441-16 3/4 443-16 1/2 445-16 3/4 447-16 1/2 449-16 3/4 451-16 1/2 453-16 3/4 455-16 1/2 457-16 3/4 459-16 1/2 461-16 3/4 463-16 1/2 465-16 3/4 467-16 1/2 469-16 3/4 471-16 1/2 473-16 3/4 475-16 1/2 477-16 3/4 479-16 1/2 481-16 3/4 483-16 1/2 485-16 3/4 487-16 1/2 489-16 3/4 491-16 1/2 493-16 3/4 495-16 1/2 497-16 3/4 499-16 1/2 501-16 3/4 503-16 1/2 505-16 3/4 507-16 1/2 509-16 3/4 511-16 1/2 513-16 3/4 515-16 1/2 517-16 3/4 519-16 1/2 521-16 3/4 523-16 1/2 525-16 3/4 527-16 1/2 529-16 3/4 531-16 1/2 533-16 3/4 535-16 1/2 537-16 3/4 539-16 1/2 541-16 3/4 543-16 1/2 545-16 3/4 547-16 1/2 549-16 3/4 551-16 1/2 553-16 3/4 555-16 1/2 557-16 3/4 559-16 1/2 561-16 3/4 563-16 1/2 565-16 3/4 567-16 1/2 569-16 3/4 571-16 1/2 573-16 3/4 575-16 1/2 577-16 3/4 579-16 1/2 581-16 3/4 583-16 1/2 585-16 3/4 587-16 1/2 589-16 3/4 591-16 1/2 593-16 3/4 595-16 1/2 597-16 3/4 599-16 1/2 601-16 3/4 603-16 1/2 605-16 3/4 607-16 1/2 609-16 3/4 611-16 1/2 613-16 3/4 615-16 1/2 617-16 3/4 619-16 1/2 621-16 3/4 623-16 1/2 625-16 3/4 627-16 1/2 629-16 3/4 631-16 1/2 633-16 3/4 635-16 1/2 637-16 3/4 639-16 1/2 641-16 3/4 643-16 1/2 645-16 3/4 647-16 1/2 649-16 3/4 651-16 1/2 653-16 3/4 655-16 1/2 657-16 3/4 659-16 1/2 661-16 3/4 663-16 1/2 665-16 3/4 667-16 1/2 669-16 3/4 671-16 1/2 673-16 3/4 675-16 1/2 677-16 3/4 679-16 1/2 681-16 3/4 683-16 1/2 685-16 3/4 687-16 1/2 689-16 3/4 691-16 1/2 693-16 3/4 695-16 1/2 697-16 3/4 699-16 1/2 701-16 3/4 703-16 1/2 705-16 3/4 707-16 1/2 709-16 3/4 711-16 1/2 713-16 3/4 715-16 1/2 717-16 3/4 719-16 1/2 721-16 3/4 723-16 1/2 725-16 3/4 727-16 1/2 729-16 3/4 731-16 1/2 733-16 3/4 735-16 1/2 737-16 3/4 739-16 1/2 741-16 3/4 743-16 1/2 745-16 3/4 747-16 1/2 749-16 3/4 751-16 1/2 753-16 3/4 755-16 1/2 757-16 3/4 759-16 1/2 761-16 3/4 763-16 1/2 765-16 3/4 767-16 1/2 769-16 3/4 771-16 1/2 773-16 3/4 775-16 1/2 777-16 3/4 779-16 1/2 781-16 3/4 783-16 1/2 785-16 3/4 787-16 1/2 789-16 3/4 791-16 1/2 793-16 3/4 795-16 1/2 797-16 3/4 799-16 1/2 801-16 3/4 803-16 1/2 805-16 3/4 807-16 1/2 809-16 3/4 811-16 1/2 813-16 3/4 815-16 1/2 817-16 3/4 819-16 1/2 821-16 3/4 823-16 1/2 825-16 3/4 827-16 1/2 829-16 3/4 831-16 1/2 833-16 3/4 835-16 1/2 837-16 3/4 839-16 1/2 841-16 3/4 843-16 1/2 845-16 3/4 847-16 1/2 849-16 3/4 851-16 1/2 853-16 3/4 855-16 1/2 857-16 3/4 859-16 1/2 861-16 3/4 863-16 1/2 865-16 3/4 867-16 1/2 869-16 3/4 871-16 1/2 873-16 3/4 875-16 1/2 877-16 3/4 879-16 1/2 881-16 3/4 883-16 1/2 885-16 3/4 887-16 1/2 889-16 3/4 891-16 1/2 893-16 3/4 895-16 1/2 897-16 3/4 899-16 1/2 901-16 3/4 903-16 1/2 905-16 3/4 907-16 1/2 909-16 3/4 911-16 1/2 913-16 3/4 915-16 1/2 917-16 3/4 919-16 1/2 921-16 3/4 923-16 1/2 925-16 3/4 927-16 1/2 929-16 3/4 931-16 1/2 933-16 3/4 935-16 1/2 937-16 3/4 939-16 1/2 941-16 3/4 943-16 1/2 945-16 3/4 947-16 1/2 949-16 3/4 951-16 1/2 953-16 3/4 955-16 1/2 957-16 3/4 959-16 1/2 961-16 3/4 963-16 1/2 965-16 3/4 967-16 1/2 969-16 3/4 971-16 1/2 973-16 3/4 975-16 1/2 977-16 3/4 979-16 1/2 981-16 3/4 983-16 1/2 985-16 3/4 987-16 1/2 989-16 3/4 991-16 1/2 993-16 3/4 995-16 1/2 997-16 3/4 999-16 1/2

German Coll. list of June 20,
1887.....50¢10¢50¢10¢5¢
Covert Halter, Hitching and Breast
50¢25¢
Covert Traces.....50¢25¢
Onelida Halter Chain.....60¢60¢5¢
Galvanized Pump Chain.....\$55¢55¢
Jack Chain, Iron.....75¢75¢5¢
Jack Chain, Brass.....70¢70¢5¢

Chalk—
White.....\$ gr 50¢
Red.....\$ gr 70¢
Blue.....\$ gr 80¢
White Crayons, \$ gr 12¢12¢1/2¢
10¢

Chalk Lines—
See Lines.

Chisels—
Socket Framing and Firmer.
P. S. & W.....75¢5¢75¢10¢
New Haven.....75¢5¢75¢10¢
Wetherby.....75¢5¢75¢10¢
Mix.....75¢5¢75¢10¢
Ohio Tool Co.....75¢5¢75¢10¢
Douglass.....75¢5¢75¢10¢
Buck Bros.....80¢
Merrill.....60¢10¢60¢10¢5¢
L. & J. J. White.....60¢10¢60¢10¢5¢

Tanged and Miscellaneous—
Butcher's.....40¢10¢
Spear & Jackson's.....\$4.75¢5.00
Buck Bros.....\$5 to 2
Cold Chisels, \$ b.....16¢19¢

Chucks—
Beach Pat.....each, \$5.00.....20¢
Morse's Adjustable, each, \$7.00, dis 20¢25¢
Danbury.....each, \$5.00, dis 30¢30¢5¢
Syracuse, Balz Pat.....25¢

Clamps—
Providence Tool Co.'s Wrought Iron, 25¢
Adjustable, Gray's.....20¢
Adjustable, Lambert's.....20¢
Adjustable, Snow's.....40¢5¢
Adjustable, Hammers.....15¢
Stearns's Adjustable Cabinet and Cor-
ner.....20¢10¢
Cabinet, Sargent's.....60¢10¢
Carriage Makers', Sargent's.....70¢10¢
Eberhard Mfg. Co.....40¢5¢40¢10¢
Warner's.....40¢10¢40¢10¢5¢
Saw Clamps, see Vises

Clips—
Norway, Axle, 1/4 & 5/8.....55¢55¢5¢
2nd grade Norway Axle, 1/4 & 5/8.....55¢55¢
Superior Axle Clips.....60¢55¢60¢55¢

Norway Spring Bar Clips, 5-16, 60¢55¢5¢
Wrought-Iron Felloe Clips.....\$ b, 5¢
Steel Felloe Clips.....\$ b, 5¢
Baker Axle Clips.....25¢

Cockeyes.....50¢
Cocks, Brass.....40¢10¢25¢
Hardware list.....20¢10¢

Coffee Mills—
Box and Side, list revised Jan. 1, 1888,
50¢25¢
American, Enterprise Mfg. Co. 20¢10¢30¢
The "Swift," Lane Bros.....20¢10¢

Compasses, Dividers, &c—
Compass, Callipers, Dividers, 70¢70¢10¢
Bemis & Call Co.'s Dividers.....60¢5¢
Bemis & Call Co.'s Compasses & Call.
pers.....50¢5¢
Bemis & Call Co.'s Wing & Inside or
Outside.....50¢5¢
Bemis & Call Co.'s Double.....60¢
Bemis & Call Co.'s (Call's Pat. Inside).....30¢
Excelsior.....60¢
J. Stevens & Co.'s Callipers and Dividers
pers.....25¢10¢
Starrett's Spring Callipers and Dividers
25¢10¢10¢
Starrett's Lock Callipers and Dividers
25¢10¢
Starrett's Combination Dividers.....25¢10¢

Coopers' Tools—
Bradley's.....20¢
Barton's.....30¢20¢5¢
L. & J. White.....20¢5¢
Albion Mfg. Co.....25¢
Beatty's.....40¢40¢5¢
Sandusky Tool Co.....30¢30¢5¢

Corkscrews—
Humason & Beckley Mfg. Co. 40¢40¢10¢
Clough's Pat.....35¢35¢45¢
Howe Bros & Hulbert.....35¢

Cork Knives and Cutters—
Bradley's.....10¢
Wadsworth's.....25¢

Cradles—
Grain.....50¢25¢

Crow Bars—
Cast Steel.....\$ b 4¢
Iron, Steel Points.....\$ b 3 1/2¢

Curry Combs—
Fitch's.....50¢10¢50¢10¢10¢
Rubberper doz \$10.00.....20¢
Perfect.....50¢

Curtain Pins—
Silvered Glass.....net
White Enamel.....net

Cutlery—
Beaver Falls & Booth's.....38¢
Wostenholme.....\$7.75 to 2

Dampers, &c—
Dampers, Buffalo.....50¢
Buffalo Damper Clips.....50¢
Crown Damper.....40¢
Excelsior.....40¢10¢

Dividers—
See Compasses.

Dog Collars—
Embossed, Gilt, Pope & Steven's list
30¢10¢
Leather, Pope & Steven's list.....30¢10¢
Brass, Pope & Steven's list.....40¢

Door Springs—
Torrey's Rod, regular size.....\$ doz \$1.30
Gray's, \$ gr.....20¢
See Rod \$ gr \$20.00.....20¢
Warner's No. 1, \$ doz, \$2.50; No. 2,
\$3.30.....40¢10¢50¢
Gem (Coll), list April 19, 1888.....10¢
Star (Coll), list April 19, 1888.....20¢
Victor (Coll).....60¢60¢10¢
Champion (Coll).....60¢10¢60¢10¢10¢
Philadelphia, 5 in., \$5.00; 8 in., \$7.75.....35¢
Cowell's, No. 1, \$ doz, \$15.00; No. 2,
\$15.00.....50¢
Rubber, complete, \$ doz, \$4.50.....55¢10¢
Hercules.....50¢
Shaw Door Check and Spring.....25¢30¢35¢

Drawing Knives—
Wetherby.....75¢5¢
P. S. & W.....75¢5¢
Mix.....75¢10¢
New Haven.....60¢10¢60¢10¢5¢
Merrill.....60¢10¢60¢10¢5¢
Douglass.....75¢75¢5¢
L. & J. J. White.....15¢10¢25¢
Bradley's.....25¢
Adjustable Handle.....25¢35¢
Wilkinson's Folding.....25¢25¢5¢

Drills and Drill Stocks—
Blacksmith's.....each \$1.75
Blacksmith's Self-Feeding, each \$7.50, dis
40¢10¢
Breast, P. S. & W.....40¢10¢
Breast, Wilson's.....30¢5¢
Breast, Millers Falls.....each \$3.00, dis 25¢
Breast, Bartholomew's.....each \$2.50, dis
25¢10¢40¢
Ratchet, Merrill's.....20¢20¢5¢
Ratchet, Ingersoll's.....20¢20¢5¢
Ratchet, Parker's.....20¢20¢5¢
Ratchet, Whitney's.....20¢10¢
Ratchet, Weston's.....20¢25¢
Ratchet, Moore's Triple Action.....25¢30¢
Whitney's Hand Drill, Plain, \$11.00;
Adjustable, \$12.00.....30¢10¢
Wilson's Drill Stocks.....10¢
Automatic Boring Tools.....\$1.75¢1.85

Twist Drills—
Morse.....50¢10¢5¢
Standard.....50¢10¢5¢
Syracuse.....50¢10¢5¢
Cleveland.....50¢10¢5¢
Williams.....50¢10¢10¢

Drill Bits—See Augers and Bits.

Drill Chucks—See Chucks.

Dripping Pans—
Small sizes.....\$ b 6¢
Large sizes.....\$ b 6 1/2¢

Egg Beaters—
Dover.....\$ doz \$1.50
National, \$ doz \$4.50.....35¢
Family (T. & S. Mfg. Co.), \$ gro \$17.00¢
\$15.00
Duplex (Standard Co.).....\$ gro \$15.00
Rival (Standard Co.).....\$ gro \$12.00
Large Duplex (Standard Co.), \$ doz \$4.50
Triumph (T. & S. Mfg. Co.), \$ gro \$10.50
\$11.50

Advance, No. 1.....\$ gro \$10.50
Advance, No. 2.....\$ gro \$10.00
Bryant's.....\$ gro \$15.00
Ayres' Spiral.....\$ gro \$5.00
Double (H. & R. Mfg. Co.).....\$ gro \$12.00
Easy (H. & R. Mfg. Co.).....\$ gro \$14.00
Spiral (H. & R. Mfg. Co.).....\$ gro \$12.00
Spiral (H. & R. Mfg. Co.).....\$ gro \$4.50
Faine, Diehl & Co.'s.....\$ gro \$24.00

Egg Poachers—
Buffalo Steam Egg Poachers, \$ doz, No.
1, \$5.00; No. 2, \$6.00.....25¢

Electric Bell Sets—
Wollensak's.....20¢
Bigelow & Dowse.....30¢

Emery—No. 4 to No. 54 to Flour, CF
46 gr. 150 gr. F FF.
Kegs, \$ b 4 \$ 5 \$ 6 \$ 7 \$ 8 \$ 9 \$ 10 \$ 11 \$ 12 \$ 13 \$ 14 \$ 15 \$ 16 \$ 17 \$ 18 \$ 19 \$ 20 \$ 21 \$ 22 \$ 23 \$ 24 \$ 25 \$ 26 \$ 27 \$ 28 \$ 29 \$ 30 \$ 31 \$ 32 \$ 33 \$ 34 \$ 35 \$ 36 \$ 37 \$ 38 \$ 39 \$ 40 \$ 41 \$ 42 \$ 43 \$ 44 \$ 45 \$ 46 \$ 47 \$ 48 \$ 49 \$ 50 \$ 51 \$ 52 \$ 53 \$ 54 \$ 55 \$ 56 \$ 57 \$ 58 \$ 59 \$ 60 \$ 61 \$ 62 \$ 63 \$ 64 \$ 65 \$ 66 \$ 67 \$ 68 \$ 69 \$ 70 \$ 71 \$ 72 \$ 73 \$ 74 \$ 75 \$ 76 \$ 77 \$ 78 \$ 79 \$ 80 \$ 81 \$ 82 \$ 83 \$ 84 \$ 85 \$ 86 \$ 87 \$ 88 \$ 89 \$ 90 \$ 91 \$ 92 \$ 93 \$ 94 \$ 95 \$ 96 \$ 97 \$ 98 \$ 99 \$ 100 \$ 101 \$ 102 \$ 103 \$ 104 \$ 105 \$ 106 \$ 107 \$ 108 \$ 109 \$ 110 \$ 111 \$ 112 \$ 113 \$ 114 \$ 115 \$ 116 \$ 117 \$ 118 \$ 119 \$ 120 \$ 121 \$ 122 \$ 123 \$ 124 \$ 125 \$ 126 \$ 127 \$ 128 \$ 129 \$ 130 \$ 131 \$ 132 \$ 133 \$ 134 \$ 135 \$ 136 \$ 137 \$ 138 \$ 139 \$ 140 \$ 141 \$ 142 \$ 143 \$ 144 \$ 145 \$ 146 \$ 147 \$ 148 \$ 149 \$ 150 \$ 151 \$ 152 \$ 153 \$ 154 \$ 155 \$ 156 \$ 157 \$ 158 \$ 159 \$ 160 \$ 161 \$ 162 \$ 163 \$ 164 \$ 165 \$ 166 \$ 167 \$ 168 \$ 169 \$ 170 \$ 171 \$ 172 \$ 173 \$ 174 \$ 175 \$ 176 \$ 177 \$ 178 \$ 179 \$ 180 \$ 181 \$ 182 \$ 183 \$ 184 \$ 185 \$ 186 \$ 187 \$ 188 \$ 189 \$ 190 \$ 191 \$ 192 \$ 193 \$ 194 \$ 195 \$ 196 \$ 197 \$ 198 \$ 199 \$ 200 \$ 201 \$ 202 \$ 203 \$ 204 \$ 205 \$ 206 \$ 207 \$ 208 \$ 209 \$ 210 \$ 211 \$ 212 \$ 213 \$ 214 \$ 215 \$ 216 \$ 217 \$ 218 \$ 219 \$ 220 \$ 221 \$ 222 \$ 223 \$ 224 \$ 225 \$ 226 \$ 227 \$ 228 \$

Cross-Cut Saw Handles—
 Atkins' No. 1 Loop, # pair, 30¢; No. 3, 22¢; No. 2 and No. 4 Reversible, 22¢.
 Boynton's Loop Saw Handles, 50¢.
 Champion.....15¢

Hangers—

Barn Door, old patterns.....60¢10¢10¢70¢
 Barn Door, New England.....60¢10¢10¢70¢
 Samson Steel Anti-Friction.....55¢
 Orleans Steel.....55¢
 Hamilton Wrought Wood Track.....55¢
 U. S. Wood Track.....55¢
 Champion.....60¢10¢
 Rider and Wooster, Medina Mfg. Co.,
 list.....70¢
 Climax Anti-Friction.....60¢
 Climax Anti-Friction for Wood Track.....55¢
 Zenith for Wood Track.....55¢
 Reed's Steel Arm.....50¢
 Challenge, Barn Door.....50¢
 Sterling's Improved (Anti-Friction).....55¢10¢
 Victor, No. 1, \$15.00; No. 2, \$15.50; No. 3, \$18.00.....50¢10¢
 Chertree.....50¢10¢
 Kidder's.....50¢10¢
 The "Boss".....60¢
 Best Anti-Friction.....60¢
 Duplex (Wood Track).....60¢
 Terry's Pat., # dos pr. 4 in., \$10.00; 5 in., \$12.00.....50¢5¢10¢10¢
 Cronk's Pat., No. 4, \$12.00; No. 5, \$14.40; No. 6, \$18.00.....50¢10¢60¢
 Wood Track Iron Clad, # ft. 10.....50¢

Carrier Steel Anti-Friction.....50¢50¢10¢
 Architect, # set \$6.00.....20¢10¢
 Felix, # set \$4.50.....20¢
 Richards.....30¢30¢10¢
 Lane's Steel Anti-Friction.....40¢10¢
 Ball Bearing Door Hanger.....30¢10¢25¢10¢
 Warner's Pat.....20¢20¢10¢
 Starns' Anti-Friction.....25¢10¢25¢10¢10¢
 Starns' Challenge.....40¢40¢10¢
 Faultless.....40¢40¢10¢
 American, # set \$6.00.....30¢10¢
 Rider & Wooster, No. 1, 62¢; No. 2, 75¢.....40¢
 Paragon, Nos. 1, 2 and 3.....40¢10¢
 Paragon, Nos. 5, 6, 7 and 8.....20¢10¢
 Crescent.....60¢60¢10¢
 Nickel, Cast Iron.....50¢
 Nickel, Malleable Iron and Steel.....40¢
 Scranton Anti-Friction Single Strap.....35¢40¢
 Scranton Anti-Friction Double Strap.....40¢
 Universal Anti-Friction.....40¢
 Wild West, 4 in. Wheel, \$15.00; 5 in. Wheel, \$21.00.....40¢10¢40¢10¢5¢
 Star.....40¢10¢40¢10¢
 May.....50¢5¢50¢10¢
 Barry, \$6.00.....40¢10¢

Harness Snaps—
 See Snaps.

Hatchets—
 List Jan. 1, 1888.....35¢40¢
 Isaiah Blood.....40¢
 Hunt's Shingling, Lath and Claw.....40¢
 Hunt's Broad.....40¢10¢50¢
 Buffalo Hammer Co.....40¢10¢50¢
 Hurd's.....40¢10¢50¢
 Fayette R. Plumb.....40¢10¢50¢
 Wm. Mann, Jr., & Co.....50¢50¢
 Underhill Edge Tool Co.....40¢50¢10¢
 Underhill's, Haines and Bright.....40¢10¢
 C. Hammond & Son.....40¢10¢50¢
 Simmons.....40¢10¢40¢10¢5¢
 Peck's.....40¢10¢40¢10¢5¢
 Kelly's.....50¢50¢5¢
 Sargent & Co.....50¢
 Ten Eyck Edge Tool Co.....40¢10¢40¢10¢5¢
 Collins.....10¢

Hay and Straw Knives—
 Lightning, Mfrs. price # doz \$18.00, 25¢
 But j bbers frequently give extras.
 Electric.....# doz \$10
 Gem.....40¢7¢40¢10¢
 Carter's Needle.....# doz \$11.50¢12.00
 Heath's.....# doz \$13.50¢14.00
 Auburn Hay, Com. and Spear Point.....40¢
 Auburn, Straw.....40¢

Hinges—
Wrought Iron Hinges
 Strap and P.....75¢75¢5¢
 Screw Hook and.....6 to 12 in., # B.....35¢
 Strap.....14 to 20 in., # B.....35¢
 Strap.....22 to 36 in., # B.....25¢
 Heavy Welded.....6 to 12 in., # B.....35¢
 Hook.....14 to 20 in., # B.....35¢
 Hook.....18 to 36 in., # B.....25¢
 Screw Hook.....14 in., # doz \$2.45, 10¢
 and Eye.....14 in., # doz \$3.80, 10¢
 Rolled Blind Hinges, Nos. 32 and 34.....60¢10¢
 Rolled Blind Hinges, Nos. 232 and 234.....55¢10¢
 Rolled Plate.....70¢10¢
 Plate Hinges, 8, 10 & 12 in., # B.....55¢
 "Providence" over 12 in., # B.....45¢

Spring Hinges—
 Geer's Spring and Blank Butts.....40¢
 Union Spring Hinge Co's list, March, 1888.....30¢
 Ames and U. S.....30¢
 Empire and Crown.....30¢
 Hero and Monarch.....50¢
 American, Gem, and Star, Japaned.....50¢
 American, Gem, and Star, Bronzed.....net
 Oxford, Bronze and Brass.....net
 Barker's Double Acting.....20¢10¢
 Union Mfg. Co.....30¢
 Bommer's.....30¢
 Buckman's.....15¢30¢
 Chicago.....30¢
 Wiles.....10¢
 Devore's.....40¢
 Rex.....40¢

Gate Hinges—
 Western.....# doz \$4.40, 60¢
 N. E.....# doz \$7.00, 55¢
 N. E. Reversible.....# doz \$5.20, 55¢10¢
 Clark's, Nos. 1, 2, 3.....60¢10¢5¢
 M. Y. State.....# doz \$6.00, 55¢10¢
 Automatic.....# doz \$12.50, 50¢
 Common Sense.....# doz pair \$4.50, 55¢
 Seymour's.....45¢10¢
 Shepard's.....60¢10¢5¢
 Reed's Latch and Hinges.....# doz \$12.00, 50¢

Blind Hinges—
 Parker.....75¢25¢
 Palmer.....50¢10¢
 Seymour.....70¢10¢
 Nicholson.....45¢10¢
 Huffer.....50¢
 Clark's, Nos. 1, 3, 5, 40 and 50.....75¢10¢5¢80¢

Clark's Mortise Gravity.....50¢
 Sargent's, Nos. 1, 3, 5, 11, 13.....75¢10¢75¢10¢5¢
 Sargent's, No. 12.....75¢10¢10¢
 Reading's Gravity.....75¢10¢75¢10¢5¢
 Shepard's Noiseless Niagara Buffalo, Champion, Steamboat, Clark's Old Pattern and Clark's Tip Pattern.....75¢10¢5¢
 Shepard's O. S., Lull & Porter.....75¢10¢
 Shepard's Acme, Lull & Porter.....75¢5¢
 Shepard's Queen City Reversible.....75¢
 Clark's Lull & Porter, Nos. 0, 1, 15, 2, 2 1/2, 3.....75¢10¢5¢
 North's Automatic Blind Fittings, No. 2, for Wood, \$10.50; No. 3, for Brick, \$13.50.....25¢25¢

Hoes—
Handled—
 Garden, Mortar, &c.....65¢
 Planter's, Cotton, &c.....65¢
 Warren Hoe.....60¢
 Magic.....# doz \$4.00

Eye—
 D. & H. Scovill.....20¢
 Lane's Crescent Planter's Pattern.....45¢5¢
 Lane's Razor Blade, Scovill Pattern.....30¢
 Maynard, S. & O. Pat.....45¢5¢
 Brusky Tool Co., S. & O. Pat.....30¢
 Hubbard & Co., S. & O. Pat.....60¢
 Chattanooga Tool Co., S. & O. Pat.....60¢
 Grub.....60¢60¢10¢

Hog Rings and Ringers—
 Hill's Improved Ringers.....# doz \$4.50
 Hill's Old Style Ringers.....# doz \$3.00
 Hill's Tongs.....# doz \$4.50
 Hill's Rings.....# doz bxs \$2.25¢2.40
 Perfect Ringers.....# doz bxs \$1.75¢2.00
 Blair's Hog Ringers.....# doz \$2.00¢2.25
 Blair's Hog Ringers.....# doz \$2.00¢2.25
 Champion Ringers, Double.....# doz \$2.25
 Brown's Ringers.....# doz \$2.00
 Brown's Ringers.....# doz \$1.25¢1.30

Holisting Apparatus—
 "Moore's" Hand Holist, with Lock.....20¢
 "Moore's" Differential Pulley Block.....20¢
 Energy Mfg. Co's.....25¢

Holders, File and Tool—
 Balz Pat.....# doz \$4.00, 35¢
 Nicholson File Holders.....20¢

Hollow-Ware—
Iron—
 Stove Hollow-Ware—
 Ground.....60¢60¢5¢
 Unground.....60¢10¢60¢10¢
 Enamelled Hollow-Ware—
 Maslin Kettles.....65¢10¢
 Boilers and Saucepans.....40¢5¢
 Tinned Boilers and Saucepans.....40¢
 Gray Enamelled-Ware.....50¢50¢5¢
 Stove.....50¢50¢5¢
 Maslin Kettles.....60¢10¢60¢10¢10¢
 Boilers and Saucepans.....40¢5¢
 Agate and Granite Ware.....25¢
 Rustless Hollow-Ware.....50¢50¢5¢
 Galvanized Tea-Kettles—
 In.....5 6 7 8 9
 Each.....55¢ 60¢ 65¢ 75¢

Silver Plated—
 4 mo. or 5 1/2 cash in 30 days.
 Reed & Barton.....40¢5¢
 Meriden Britannia Co.....40¢5¢
 Simpson, Hall, Miller & Co.....40¢5¢
 Rogers & Brothers.....40¢5¢
 Hartford Silver Plate Co.....40¢5¢5¢
 William Rogers Mfg. Co.....40¢5¢5¢

Hooks—
Cast Iron—
 Bird Cage, Sargent's list.....60¢10¢10¢
 Bird Cage, Reading.....60¢10¢10¢
 Clothes Line, Sargent's list.....60¢10¢10¢
 Clothes Line, Reading list.....60¢10¢10¢
 Ceiling, Sargent's list.....55¢10¢10¢
 Harness, Reading list.....55¢10¢10¢
 Coat and Hat, Sargent's list.....55¢10¢10¢
 Coat and Hat, Reading.....50¢10¢50¢10¢10¢

Wrought Iron—
 Cotton.....# doz \$1.36
 Cotton Pat. (N.Y. Mallet & Handle Wks.).....50¢
 Tassel and Picture (T. & S. Mfg. Co.).....50¢
 Wrought Staples, Hooks, &c.....See Wrought Goods.

Wire—
 Wire Coat and Hat, Gam, list April, 1888.....45¢
 Wire Coat and Hat, Miles, list April, 1888.....45¢
 Indestructible Coat and Hat.....45¢
 Wire Coat and Hat, Standard.....45¢
 Belt.....75¢10¢80¢

Miscellaneous.
 Grass, No. 2, \$2.00; No. 3, \$2.25; No. 4, \$2.50.....55¢90¢
 Bush.....55¢90¢
 Whimetre Patent.....55¢
 Hooks and Eyes—Malleable Iron.....70¢70¢10¢
 Hooks and Eyes—Brass.....60¢10¢10¢
 Fish Hooks, American.....50¢
 Bench Hooks.....See Bench Stops.

Horse Nails—
 Nos. 6 7 8 9 10
 Ausable.....25¢25¢25¢24¢23¢
 Clinton, Fin.....24¢22¢21¢20¢19¢
 Essex.....25¢25¢25¢24¢23¢
 Lysa.....25¢25¢25¢24¢23¢
 Snowden.....25¢25¢25¢24¢23¢
 Putnam.....23¢21¢20¢19¢18¢
 Vulcan.....23¢21¢20¢19¢18¢
 Northwest.....25¢25¢25¢24¢23¢
 Globe.....23¢21¢20¢19¢18¢
 Boston.....23¢21¢20¢19¢18¢
 A. C.....25¢25¢25¢24¢23¢
 C. B. R.....25¢25¢25¢24¢23¢
 Champlain.....25¢25¢25¢24¢23¢

New Haven.....25¢25¢25¢24¢23¢
 Saranac.....23¢21¢20¢19¢18¢
 Champion.....25¢25¢25¢24¢23¢
 Capewell.....25¢25¢25¢24¢23¢
 Star.....23¢21¢20¢19¢18¢
 Anchor.....23¢21¢20¢19¢18¢
 Western.....23¢21¢20¢19¢18¢
 Empire Bronzed.....14¢7¢
Horse Shoes—See Shoes Horse.

Hose, Rubber—
 Competition.....75¢10¢75¢10¢5¢
 Standard.....70¢70¢10¢
 Extra.....60¢60¢10¢
 N. Y. B. & P. Co., Para.....30¢10¢
 N. Y. B. & P. Co., Extra.....50¢
 N. Y. B. & P. Co., Dundee.....60¢10¢5¢

Huskers—
 Blair's Adjustable.....# gr \$8.00
 Blair's Adjustable Clipper.....# gr 7.00

Indurated Fiber-Ware.
 Spittoons, No. 2, # doz.....\$2.75
 Basins, Ringed, # doz, No. 1, \$3.70; No. 2, \$3.10; No. 3.....\$2.70
 Washtubs, Nested, Nos. 0, 1, 2 and 3 (4 pieces), # doz, nests.....\$18.87
 Keelers, Nested, Nos. 1, 2, 3 and 4 (4 pieces), # doz, nests.....\$8.37
 Butter Bowls, 15, 17 and 19-inch (3 pieces), # doz, nests.....\$8.75
 Liquid Measures, pt., qt., 2 qt. and funnel (4 pieces) # set.....\$8.00
 Dry Measures, 1, 2, 4, 8 and 16 qts. (6 pieces), # set.....\$2.25
 See also *Patls.*

Jack Screws—See Screws.

Kettles—
 Spun. Stamped.
 Brass, 7 to 17 in., # B.....24¢ 21¢
 Brass larger than 17 in., # B.....26¢ 23¢
 Enamelled and Tea Kettles.....See Hollow-Ware.

Keys—
 Lock Ass'n list Dec. 30, 1888.....50¢10¢
 Eagle, Cabinet, &c.....35¢42¢
 Hotchkiss' Brass Blanks.....40¢
 Hotchkiss' Copper and Tinned.....40¢
 Hotchkiss' Pad and Cab.....35¢
 Ratchet Bed Keys.....# doz \$4.00, 15¢
 Wollensak Tinned.....50¢10¢

Knife Sharpeners—
 Parkin's Applewood Handles.....# doz \$6.00
 Parkin's Rosewood or Cocobolo.....# doz \$9.00

Knives—
 Wilson's Butcher Knives.....25¢80¢
 Ames' Butcher Knives.....25¢
 Foster Bros' Butcher.....40¢
 Nichols' Butcher Knives.....40¢10¢
 Ames' Shoe Knives.....20¢25¢
 Ames' Bread Knives.....# doz \$1.50, 15¢90¢
 Moran's Shoe and Bread.....20¢
 Hay and Straw.....See Hay Knives.
 Table and Pocket.....See Cutlery.
 Corn, Auburn Mfg. Co. Western Pat.....\$2.00
 Corn, Auburn Mfg. Co. Crescent.....\$3.50

Knobs—
 Door Mineral.....65¢68¢
 Door Por. Nickel.....75¢78¢
 Door Por. Nickel.....\$2.00¢2.25
 Door Por. Plated, Nickel.....\$2.00¢2.25
 Drawer, Porcelain.....60¢10¢60¢10¢10¢
 Hematite Door Knobs.....40¢10¢60¢
 Yale & Towne Door Knob, list Dec., 1888.....40¢
 Furniture Wood Screws.....75¢ gro inch, 10¢
 Base, Rubber Tip.....70¢10¢5¢
 Picture, Judd's.....60¢10¢10¢70¢
 Picture, Sargent's.....70¢10¢
 Picture, Hematite.....35¢5¢
 Shutter, Porcelain.....65¢10¢
 Carriage, Jap.....# gro 80¢, 60¢10¢

Ladders—
 Melting, Sargent's.....55¢10¢
 Melting, Reading.....35¢10¢
 Melting, Monroe's Pat.....# doz \$4.00, 40¢
 Melting, P. S. & W.....35¢10¢40¢
 Melting, Warner's.....30¢

Lawn Mowers—
 Standard list.....50¢10¢
 Quaker City.....60¢10¢
 Enterprise.....60¢10¢

Lanterns—
Tubular—
 Light with Guards, # doz.....\$4.00¢4.25
 Plain with Guards.....\$4.50¢4.75
 Square Plain, with Guards.....\$4.00¢4.25
 Sq. Lift Wire, with Guards.....\$4.25¢4.50
 Without Guards, 25¢ # doz less.
Miscellaneous.
 Police, Small, \$6.00; Medium, \$7.25; Large, \$9.75.....30¢25¢

Lemon Squeezers—
 Porcelain Lined, No. 1.....# doz \$6.00, 25¢30¢
 Wood, No. 2.....# doz \$3.00, 35¢
 Wood, Common.....# doz \$1.70¢1.75
 Dunlap's Improved.....# doz \$3.75, 20¢
 Sammis.....No. 1, \$5.00; No. 2, \$6.12;
 \$18 # doz.....25¢10¢
 Jennings' "Star".....# doz \$2.50
 The "Boss".....# doz \$2.50
 Dean's, Nos. 1, # doz \$6.50; 2, \$3.35; 3, \$1.90
 Little Giant.....50¢50¢5¢
 King.....40¢5¢

Lines—
 Cotton and Linen Fish, Draper's.....50¢
 Draper's Chalk.....60¢
 Draper's Mason's Linen, 84 ft., No. 1, \$1.25; No. 2, \$1.75; No. 3, \$2.25; No. 4, \$2.75; No. 5, \$3.25.....25¢
 Cotton Chalk.....55¢
 Samson, Cotton, No. 4, \$2; No. 4 1/2, \$2.50; No. 5, \$3.00; No. 6, \$3.50; No. 7, \$4.00; No. 8, \$4.50; No. 9, \$5.00; No. 10, \$5.50; No. 11, \$6.00; No. 12, \$6.50; No. 13, \$7.00; No. 14, \$7.50; No. 15, \$8.00; No. 16, \$8.50; No. 17, \$9.00; No. 18, \$9.50; No. 19, \$10.00; No. 20, \$10.50; No. 21, \$11.00; No. 22, \$11.50; No. 23, \$12.00; No. 24, \$12.50; No. 25, \$13.00; No. 26, \$13.50; No. 27, \$14.00; No. 28, \$14.50; No. 29, \$15.00; No. 30, \$15.50; No. 31, \$16.00; No. 32, \$16.50; No. 33, \$17.00; No. 34, \$17.50; No. 35, \$18.00; No. 36, \$18.50; No. 37, \$19.00; No. 38, \$19.50; No. 39, \$20.00; No. 40, \$20.50; No. 41, \$21.00; No. 42, \$21.50; No. 43, \$22.00; No. 44, \$22.50; No. 45, \$23.00; No. 46, \$23.50; No. 47, \$24.00; No. 48, \$24.50; No. 49, \$25.00; No. 50, \$25.50; No. 51, \$26.00; No. 52, \$26.50; No. 53, \$27.00; No. 54, \$27.50; No. 55, \$28.00; No. 56, \$28.50; No. 57, \$29.00; No. 58, \$29.50; No. 59, \$30.00; No. 60, \$30.50; No. 61, \$31.00; No. 62, \$31.50; No. 63, \$32.00; No. 64, \$32.50; No. 65, \$33.00; No. 66, \$33.50; No. 67, \$34.00; No. 68, \$34.50; No. 69, \$35.00; No. 70, \$35.50; No. 71, \$36.00; No. 72, \$36.50; No. 73, \$37.00; No. 74, \$37.50; No. 75, \$38.00; No. 76, \$38.50; No. 77, \$39.00; No. 78, \$39.50; No. 79, \$40.00; No. 80, \$40.50; No. 81, \$41.00; No. 82, \$41.50; No. 83, \$42.00; No. 84, \$42.50; No. 85, \$43.00; No. 86, \$43.50; No. 87, \$44.00; No. 88, \$44.50; No. 89, \$45.00; No. 90, \$45.50; No. 91, \$46.00; No. 92, \$46.50; No. 93, \$47.00; No. 94, \$47.50; No. 95, \$48.00; No. 96, \$48.50; No. 97, \$49.00; No. 98, \$49.50; No. 99, \$50.00; No. 100, \$50.50; No. 101, \$51.00; No. 102, \$51.50; No. 103, \$52.00; No. 104, \$52.50; No. 105, \$53.00; No. 106, \$53.50; No. 107, \$54.00; No. 108, \$54.50; No. 109, \$55.00; No. 110, \$55.50; No. 111, \$56.00; No. 112, \$56.50; No. 113, \$57.00; No. 114, \$57.50; No. 115, \$58.00; No. 116, \$58.50; No. 117, \$59.00; No. 118, \$59.50; No. 119, \$60.00; No. 120, \$60.50; No. 121, \$61.00; No. 122, \$61.50; No. 123, \$62.00; No. 124, \$62.50; No. 125, \$63.00; No. 126, \$63.50; No. 127, \$64.00; No. 128, \$64.50; No. 129, \$65.00; No. 130, \$65.50; No. 131, \$66.00; No. 132, \$66.50; No. 133, \$67.00; No. 134, \$67.50; No. 135, \$68.00; No. 136, \$68.50; No. 137, \$69.00; No. 138, \$69.50; No. 139, \$70.00; No. 140, \$70.50; No. 141, \$71.00; No. 142, \$71.50; No. 143, \$72.00; No. 144, \$72.50; No. 145, \$73.00; No. 146, \$73.50; No. 147, \$74.00; No. 148, \$74.50; No. 149, \$75.00; No. 150, \$75.50; No. 151, \$76.00; No. 152, \$76.50; No. 153, \$77.00; No. 154, \$77.50; No. 155, \$78.00; No. 156, \$78.50; No. 157, \$79.00; No. 158, \$79.50; No. 159, \$80.00; No. 160, \$80.50; No. 161, \$81.00; No. 162, \$81.50; No. 163, \$82.00; No. 164, \$82.50; No. 165, \$83.00; No. 166, \$83.50; No. 167, \$84.00; No. 168, \$84.50; No. 169, \$85.00; No. 170, \$85.50; No. 171, \$86.00; No. 172, \$86.50; No. 173, \$87.00; No. 174, \$87.50; No. 175, \$88.00; No. 176, \$88.50; No. 177, \$89.00; No. 178, \$89.50; No. 179, \$90.00; No. 180, \$90.50; No. 181, \$91.00; No. 182, \$91.50; No. 183, \$92.00; No. 184, \$92.50; No. 185, \$93.00; No. 186, \$93.50; No. 187, \$94.00; No. 188, \$94.50; No. 189, \$95.00; No. 190, \$95.50; No. 191, \$96.00; No. 192, \$96.50; No. 193, \$97.00; No. 194, \$97.50; No. 195, \$98.00; No. 196, \$98.50; No. 197, \$99.00; No. 198, \$99.50; No. 199, \$100.00; No. 200, \$100.50; No. 201, \$101.00; No. 202, \$101.50; No. 203, \$102.00; No. 204, \$102.50; No. 205, \$103.00; No. 206, \$103.50; No. 207, \$104.00; No. 208, \$104.50; No. 209, \$105.00; No. 210, \$105.50; No. 211, \$106.00; No. 212, \$106.50; No. 213, \$107.00; No. 214, \$107.50; No. 215, \$108.00; No. 216, \$108.50; No. 217, \$109.00; No. 218, \$109.50; No. 219, \$110.00; No. 220, \$110.50; No. 221, \$111.00; No. 222, \$111.50; No. 223, \$112.00; No. 224, \$112.50; No. 225, \$113.00; No. 226, \$113.50; No. 227, \$114.00; No. 228, \$114.50; No. 229, \$115.00; No. 230, \$115.50; No. 231, \$116.00; No. 232, \$116.50; No. 233, \$117.00; No. 234, \$117.50; No. 235, \$118.00; No. 236, \$118.50; No. 237, \$119.00; No. 238, \$119.50; No. 239, \$120.00; No. 240, \$120.50; No. 241, \$121.00; No. 242, \$121.50; No. 243, \$122.00; No. 244, \$122.50; No. 245, \$123.00; No. 246, \$123.50; No. 247, \$124.00; No. 248, \$124.50; No. 249, \$125.00; No. 250, \$125.50; No. 251, \$126.00; No. 252, \$126.50; No. 253, \$127.00; No. 254, \$127.50; No. 255, \$128.00; No. 256, \$128.50; No. 257, \$129.00; No. 258, \$129.50; No. 259, \$130.00; No. 260, \$130.50; No. 261, \$131.00; No. 262, \$131.50; No. 263, \$132.00; No. 264, \$132.50; No. 265, \$133.00; No. 266, \$133.50; No. 267, \$134.00; No. 268, \$134.50; No. 269, \$135.00; No. 270, \$135.50; No. 271, \$136.00; No. 272, \$136.50; No. 273, \$137.00; No. 274, \$137.50; No. 275, \$138.00; No. 276, \$138.50; No. 277, \$139.00; No. 278, \$139.50; No. 279, \$140.00; No. 280, \$140.50; No. 281, \$141.00; No. 282, \$141.50; No. 283, \$142.00; No. 284, \$142.50; No. 285, \$143.00; No. 286, \$143.50; No. 287, \$144.00; No. 288, \$144.50; No. 289, \$145.00; No. 290, \$145.50; No. 291, \$146.00; No. 292, \$146.50; No. 293, \$147.00; No. 294, \$147.50; No. 295, \$148.00; No. 296, \$148.50; No. 297, \$149.00; No. 298, \$149.50; No. 299, \$150.00; No. 300, \$150.50; No. 301, \$151.00; No. 302, \$151.50; No. 303, \$1

Melasses Gates—	
Stebbin's Pat.	70¢@70¢@74¢
Stebbin's Genuine	60¢@10¢@10¢
Stebbin's Tinned Ends	40¢@10¢
Chase's Hard Metal	50¢@10¢
Bush's	20¢
Lincoln's Pattern	70¢@70¢@10¢
Wood's	20¢@10¢
Boss, # dos: No. 2, \$7; No. 3, \$8; No. 4, \$10.	60¢@10¢@10¢
Money Drawers—	
Muzzles—	# dos, \$18¢@20¢
Safety	# dos, \$3.00 dis 25¢
Nails, see Trade Report.	
Wire Nails & Brads, list July 14, '87	
Wire Nails, Standard Penny—	# keg, \$2.50@2.60
Nail Puller—	
Curant Hammer	# dos \$9, net
Giant, No. 1	# dos, \$30.00, 10¢
Falcon	# dos, \$2.00, dis 25¢
Boss	# dos, \$30.00, dis 25¢
Lightning	# dos \$21.00
Nail Sets—	
Square	# gr., \$4.00@4.25
Round	# gr., \$3.50
Cannon's Diamond Point	# gr., \$12, 20¢
Nut Crackers—	
Table (H. & B. Mfg. Co.)	40¢
Blake's Pattern	# dos \$2.00, dis 10¢
Turner & Seymour Mfg. Co.	50¢
Nuts—	
Nuts, off list Jan. 1, 1888: Square, Hex.	
Hot Pressed	5.4¢ 5.9¢
Cold Punched	5.4¢ 5.5¢
In lots less than 100 lb, #, add 1/4¢; 1-lb	
boxes, add 1¢ to list.	
Oakum—	
Government	# lb 7¢ @ 8¢
U. S. Navy	# lb 6¢ @ 7¢
Navy	# lb 5¢ @ 6¢
Oilers—	
Zinc and Tin	65¢@65¢@10¢
Brass and Copper	50¢@10¢@50¢@10¢
Malleable, Hammers, Improved, No. 1,	
\$3.00; No. 2, \$4.00; No. 3, \$4.40 # dos,	
dis 10¢@10¢@10¢	
Malleable, Hammers, Old Pattern, same	
list	40¢
Prior's Pat. or "Paragon" Zinc	60¢@10¢@10¢
Prior's Pat. or "Paragon" Brass	50¢
Olmetead's Tin and Zinc	60¢
Olmetead's Brass and Copper	60¢
Broughton's Zinc	60¢
Broughton's Brass	60¢
Packing, Steam—	
Rubber—	
Standard	60¢@10¢@60¢@10¢@10¢
Extra	50¢@10¢@60¢
N. Y. B. & P. Co., Standard	60¢@10¢@5¢
N. Y. B. & P. Co., Empire	70¢
N. Y. B. & P. Co., Salamander	# lb 65¢, dis 30¢
Jenkins' Standard	# lb 80¢, dis 35¢
Miscellaneous—	
American Packing	10¢@11¢ # lb
Russia Packing	15¢@11¢ # lb
Italian Packing	15¢@11¢ # lb
Cotton Packing	15¢@11¢ # lb
Jute	7¢@8¢ # lb
Padlocks—	
See Locks.	
Pails—	
Galvanized Iron—	
Quarts	10 12 14
Hill's Light Weight, # dos, \$2.75 3.00 3.25	
Hill's Heavy Weight, # dis, 3.00 3.25 3.75	
Whiting's	2.75 3.00 3.25
Sidney Shephard & Co.	2.80 3.00 3.40
Iron Clad	2.75 3.00 3.25
Fire Buckets	2.75 3.25 3.50
Buckets, see Well Buckets.	
Indurated Fibre Ware—	
Star Pails, 12 qt	# dos \$4.50
Fire, Stable and Milk, 14 qt	# dos \$5.85
Pencils—	
Faber's Carpenters'	high list 50¢
Faber's Round Gilt	# gro \$5.25 net
Dixon's Lead	# gro \$4.50 net
Dixon's Lumber	# gro \$0.75 net
Dixon's Carpenters'	40¢@10¢
Picks—	
Railroad or Adze Eye, 5 to 6, \$12.00;	
6 to 7, \$13.00	dis 60¢@50¢@10¢
Picture Nails—	
Brass Head, Sargent's list	50¢@10¢@10¢
Brass Head, Combination list	50¢@10¢
Porcelain Head, Sargent's list	50¢@10¢@10¢
Porcelain Head, Combination list	40¢@10¢
Niles' Patent	40¢
Pinking Irons—	
# dos 65¢ net	
Pipe, Wrought Iron—	
List March 23, 1887.	
1 1/4 and under, Plain	55¢
1 1/4 and under, Galvanized	47¢
1 1/4 and over, Plain	65¢
1 1/4 and over, Galvanized	65¢
Boiler Tubes, Iron	80¢
Planes and Plane Irons—	
Wood Planes—	
Molding	50¢@50¢@10¢
Bench, First Quality	60¢@90¢@5¢
Bench, Second Quality	60¢@10¢@60¢@10¢@10¢
Balley's (Stanley R. & L. Co.)	40¢@10¢
Iron Planes—	
Balley's (Stanley R. & L. Co.)	40¢@10¢
Co.	20¢@10¢
Victor Planes (Stanley R. & L. Co.)	20¢@10¢
Steele's Iron Planes	35¢@35¢@5¢
Meriden Mal. Iron Co.'s	30¢@10¢@30¢@10¢@10¢
Davis's Iron Planes	30¢@10¢@30¢@10¢@10¢
Birmingham Plane Co.	60¢@50¢@5¢
Gage Tool Co.'s Self-Setting	40¢@40¢@5¢
Chaplin's Iron Planes	30¢@10¢@30¢@10¢@10¢
Sargent's	30¢@10¢@30¢@10¢@10¢
Plane Irons—	
Plane Irons, Butcher's	20¢@10¢
Plane Irons, Buck Bros	\$5.00@5.25 to 2
Plane Irons, Auburn Tool Co., "This-	
tle"	40¢
Sandusky Tool Co.	
Single and Cut	30¢
Double	40¢
L. & I. J. White	25¢
Pliers and Nippers—	
Button's Patent	30¢@10¢@40¢
Hall's No. 2, 5 in., \$13.50; No. 4, 7 in.,	
\$21.00 # dos	dis 20¢@10¢@35¢@5¢
Humason & Beckley Mfg. Co.	50¢@50¢@10¢
Gas Pliers	60¢
Gas Pliers, Custer's Nickel Plated	60¢@5¢
Eureka Pliers and Nippers	50¢@5¢
Russell's Parallel	25¢
P. S. & W. Cast Steel	50¢
P. S. & W. Tinner's Cutting Nippers,	
add 8¢ dis 10¢	
Carew's Pat. Wire Cutters	80¢
Morrill's Parallel, # dos, \$12.00	30¢@5¢
Cronk's 8 in., \$15.00; 10 in., \$21.00 ..	
40¢@40¢@5¢	
Plumbs and Levels—	
Regular List	70¢@10¢@70¢@10¢@10¢
Diston's	45¢@10¢
Pocket Levels	70¢@10¢@70¢@10¢@10¢
Davis Iron Levels	80¢
Davis' Inclino-meters	10¢@10¢
Peppers, Corn—	
Round or Square, 1 qt. # gr \$12.00@15.00	
Round or Square, 2 qt. # gr \$25.00@28.00	
Post Hole and Tree Augers	
and Diggers—	
Samson Post Hole Digger, # dos \$36.00,	
dis 25¢@10¢	
Fletcher Post Hole Augers, # dos \$30.00,	
dis 20¢	
Eureka Diggers	# dos \$16.00@17.00
Lead's	# dos \$8.00@9.00
Vaughan's Post Hole Auger, # dos	
\$13.00@14.00	
Kohler's Little Giant	# dos \$18.00
Kohler's Hercules	# dos \$15.00
Kohler's New Champion	# dos \$20.00
Schneider	# dos \$15.00
Ryan's Post Hole Diggers	# dos \$24.00
Cronk's Post Bars, # dos \$60.00,	
dis 50¢@50¢@10¢	
Gibb's Post Hole Digger, # dos \$30.00,	
dis 40¢@40¢@10¢	
Potato Parers—	
White Mountain	# dos \$5.00@5.50
Antrim Combination	# dos \$5.00
Hoosier	# dos \$13.50
Pruning Hooks and Shears—	
Diston's Combined Pruning Hook and	
Saw	# dos \$18.00, dis 30¢@10¢
Diston's Pruning Hook, # dos \$12.00,	
dis 20¢@10¢	
E. S. Lee & Co.'s Pruning Tools	40¢
Pruning Shears, Henry's Pat., # dos	
\$3.75@4.00 net	
Henry's Pruning Shears, # dos \$4.35@	
4.50 net	
Wheeler, M. & C. Co.'s Combination,	
# dos \$12.00, dis 20¢	
Dunlap's Saw and Chisel, # dos \$8.50,	
dis 30¢	
J. Mallinson & Co., No. 1, \$5.25; No. 2, 7.25	
Pulleys—	
Hot House, Awning, &c	60¢@10¢
Japanned Screw	60¢@10¢
Brass Screw	60¢@10¢
Japanned Side	60¢@10¢
Japanned Clothes Line	60¢@10¢
Empire Sash Pulley	55¢@60¢
Moore's Sash, Anti-Friction	50¢
Hay Fork, Solid Eye, \$4.00; 5 in. Solid,	
\$4.50	dis 50¢@10¢@50¢@10¢@5¢
Hay Fork, "Anti-Friction," 5 in. Solid,	
\$5.70	dis 50¢
Hay Fork, "F" Common and Pat.	
Bushed	20¢
Hay Fork, Tarbox Pat. Iron	30¢
Hay Fork, Reed's Self-Lubricating	60¢
Shade Rack	45¢
Tackle Blocks	See Blocks
Moore's Anti-Friction 5 in. Wheel, # dos	
\$12.00	40¢
Pumps—	
Cistern, Best Makers	50¢@10¢@60¢
Pitcher Spout, Best Makers	60¢@10¢@60¢
Pitcher Spout, Cheaper Goods	20¢@10¢
70¢@5¢	
Punches—	
Saddlers' or Drive, good, # dos	60¢@65¢
Bemis & Call Co.'s Cast Steel Drive, 50¢@5¢	
Bemis & Call Co.'s Springfield Socket, 50¢@5¢	
Spring, good quality	# dos \$2.50@2.80
Bemis & Call Co.'s Spring and Check	40¢
Solid Tinner's	# dos \$1.44, dis 55¢
Tinner's Hollow Punches	20¢@2¢
Rice Hand Punches	15¢
Avery's Revolving	30¢@10¢
Avery's Saw-Set and Punch, See Saw Sets.	
Rail—	
Sliding Door, Wrt Brass, # lb 35¢, dis 15¢	
Sliding Door, Bronzed Wrt Iron, # ft. 7¢	
Sliding Door, Iron, Painted, # foot 4¢, 40¢	
Barn Door, Light, In. 1/4 # lb	
Per 100 feet	\$2.50 3.00 4.40, dis 10¢
B. D. for N. E. Hangers	
Small, Med. Large.	
Per 100 feet	\$2.15 2.70 3.25 net
Terry's Wrought Iron, # foot	45¢@5¢
Victor Track Rail, 7¢ # foot	dis 50¢@2¢
Carrier Steel Rail, # foot	41¢
Moore's Wrought Iron	25¢
Rakes—	
Cast Steel, Association goods	65¢
Cast Steel, outside goods	60¢@10¢@70¢
Malleable	70¢@70¢@5¢
Gibbs Lawn Rake	\$12.00, dis 50¢
Canton Lawn Rake	\$9.00, dis 50¢
Ft. Madison Prize Bow Brace and Peer,	
less	55¢
Fort Madison Steel Tooth Lawn Rake,	
\$6.00	dis 25¢
Razors—	
J. R. Torrey Razor Co.	20¢
Wostenholme and Butcher, \$10.00 to 2,	
dis 10¢	
Razor Straps—	
Genuine Emerson	60¢@60¢@5¢
Imitation	# dos \$2.00, dis 20¢@10¢@5¢
Torrey's	20¢
Badger's Belt and Com.	# dos \$2.00
Lamont Combination	# dos \$4.00
Rivets and Burrs—	
Copper	50¢
Iron, list Nov. M. '87	50¢
Rivet Sets—	
Stair, Brass	25¢@2¢
Stair, Black Walnut	# dos 40¢
Rollers—	
Barn Door, Sargent's list	60¢@10¢@10¢
Acme Moore's Anti-Friction	55¢
Union Barn Door Roller	70¢
Rope—	
Manufacturers' prices for large lots:	
Manila, 1/4 in. and larger # lb 15¢@	
Manila, 1/2 in. and 5-16 in. # lb 15¢@	
Manila, 3/4 in. and 1-2 in. # lb 15¢@	
Manila, Bay Rope	# lb 15¢@
Sisal, 1/4 inch and larger # lb 15¢@	
Sisal, 1/2 in. and 5-16 in. # lb 15¢@	
Sisal, 3/4 in. and 1-2 in. # lb 15¢@	
Sisal, Bay Rope	# lb 15¢@
Sisal, Tarred Rope	# lb 15¢@
Sisal, Medium Laid Yarn, # lb 15¢@	
Cotton Rope	# lb 15¢@15¢ net
Jute Rope	# lb 7¢@
Rules—	
Boxwood	80¢@10¢@80¢@10¢@10¢
Ivory	50¢@50¢@10¢
Starrett's Rules and Straight Edges,	
Steel	25¢@10¢
Sad Irons—	
From 4 to 10, at factory	# 100 lb
Self-Heating	\$2.40@2.55
Self-Heating, Tailors'	# dos \$9.00 net
Gleason's Shield and Toilet	# dos \$18.00 net
Mrs. Pot's Irons	40¢@40¢@5¢
Enterprise Star Irons	40¢
Combined Fluter and Sad Iron, # dos,	
\$15.00	dis 15¢
Fox Reversible, Self-Fluter	# dos \$24.00 net
Chinese Laundry (N. E. Butt Co.) # lb	
New England	dis 15¢
Mahony's Troy Pol. Irons	25¢
Sensible	20¢@20¢@5¢
National Self-Heating	dis 30¢
Sand and Emery Paper and	
Cloth—	
List April 12, 1888	40¢@40¢@10¢
Sibley's Emery and Crocus Cloth	30¢
Sash Cord—	
Common	# lb 10¢@11¢
Patent, good quality	# lb 15¢@15¢
White Cotton Braided, fair quality	# lb 25¢@25¢
Common Russia Sash	# lb 15¢@
Patent	# lb 15¢@
Cable Laid Italian Sash	# lb 25¢@25¢
India Cable Laid	# lb 15¢@
Silver Laid—	
A Quality, White, 50¢	dis 10¢@10¢@5¢
B Quality, White, 50¢	dis 10¢@10¢@5¢
C Quality, White, 50¢	dis 10¢@10¢@5¢
Sylvan Spring, Extra Braided, White, 3¢	
Sylvan Spring, Extra Braided, Drab, 3¢	
Semper Idem, Braided, White	30¢
Egyptian, India Hemp, Braided	25¢
Sash Locks—	
Clark's, No. 1, \$10.00; No. 2, \$8.00 # gr,	
dis 35¢@	
Ferguson's	60¢@2¢
Morris and Triumph, list Aug. 16, 1888,	
Victor	60¢@10¢@2¢
Walker's	10¢
Attwell Mfg. Co.	25¢@35¢@
Reading	60¢@10¢@60¢@10¢@10¢
Hammond's Window Springs	40¢
Common Sense, Jap'd, Cop'd and	
Br'd	# gr \$4.00
Common Sense, Nickel Plated	# gr \$10.00
Universal	30¢
Kempshall's Gravity	60¢
Kempshall's Model	60¢@60¢@10¢
Corbin's Daisy, list Feb. 15, 1888	70¢
Payson's Perfect	60¢@60¢@10¢
Hugunin's Sash Balances	25¢@5¢@2¢
Hugunin's New Sash Locks	25¢@5¢@2¢
Stoddard "Practical"	10¢
Ives' Patent	60¢@60¢@10¢
Liesche's, Nos. 100 and 110, # gr \$8,	
105, \$10.00	dis 20¢@10¢
Davis, Bronze, Barnes Mfg. Co.	50¢
Champion Safety, list March 1, 1888,	
Security	55¢@55¢@10¢
Sash Weights—	
Solid Eyes	# ton \$22.00
Sausage Stuffers or Fillers—	
Milas' "Challenge," # dos \$20.00,	
dis 50¢@50¢@5¢	
Perry	# dos, No. 1, \$15.00; No. 2,
\$21.00	dis 50¢@50¢@5¢
Draw Cut No. 4, each \$30.00	dis 20¢
Enterprise Mfg. Co.	20¢@10¢@30¢
Silver's	40¢@10¢
Saws—	
Diston's Cir-	
cular	45¢@45¢@5¢
Diston's Cross	
Cuts	45¢@45¢@5¢
Diston's Hand	25¢@25¢@5¢
Atkins' Circular Shingle and Heading	
50¢@10¢	
Atkins' Silver Steel Diamond X Cuts	
Atkins' Special Steel Dexter X Cuts	
Atkins' Special Steel Diamond X Cuts	
Atkins' Champion and Electric Tooth	
Atkins' Hollow Back X Cuts	
Atkins' Mulay, Mill and Drag	
W. M. & C. Hand	
W. M. & C. Champion X Cuts, Regu-	
lar	
W. M. & C. X Cuts, Thin Back	
Peace Circular and Mill	
Peace Hand Panel and Exp	
Peace Cross Cuts, Standard	
Peace Cross Cuts, Thin Back	
Richardson's Circular and Mill	
Richardson's X Cuts	
No. 1, 2¢; No. 2, 27¢; No. 3, 24¢	

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CURRENT METAL PRICES.

FEBRUARY 20, 1889.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market reports.

IRON AND STEEL.	
Bar Iron from Store.	
Common Iron:	
3/4 to 2 in. round and square.	\$ 1.90 @ ...
1 to 6 in. x 3/4 to 1 in.	
Refined Iron:	
3/4 to 2 in. round and square.	\$ 2.00 @ 2.10
1 to 4 in. x 3/4 to 1 1/4 in.	
4 1/2 to 6 in. x 3/4 to 1 in.	\$ 2.30 @ 2.30
1 to 6 in. x 1 1/4 and 5-16	\$ 2.30 @ 2.30
Rods—3/4 and 1-1/2 round and sq.	\$ 2.10 @ 2.30
Bands—1 to 6 x 3-16 to No. 12	\$ 2.20 @ 2.30
"Burden Best" Iron, base price.	\$ 3.00 @ ...
Burden's "H. B. & S." Iron, base price.	\$ 2.80 @ ...
"Clutter"	\$ 3.10 @ ...
Norway Rods	4.00 @ 5.00

Merchant Steel from Store.	
Per pound.	
Open-Hearth and Bessemer Machinery, Toe Calk, Tire and Sleigh Shoe, base price in small lots.	2 1/4
Best Cast Steel, base price in small lots	5 1/2
Best Cast Steel Machinery, base price in small lots	5

Sheet Iron from Store.	
Common American. R. G. Cleaned.	
10 to 16.	\$ 2.75 @ 2.80
17 to 20.	\$ 2.85 @ 3.00
21 to 24.	\$ 3.00 @ 3.10
25 and 26.	\$ 3.20 @ 3.30
27.	\$ 3.35 @ 3.45
28.	\$ 3.50 @ 3.60
Galv'd, 14 to 20.	\$ 4.50 @ 4.60
Galv'd, 1 to 24.	\$ 4.75 @ 4.85
Galv'd, 25 to 28.	\$ 5.25 @ 5.35
Galv'd, 27.	\$ 5.35 @ 5.45
Galv'd, 28.	\$ 5.60 @ 5.70
Patent Planished.	\$ 4.10 @ 4.20
Russia.	\$ 4.40 @ 4.50
American Cold Rolled B. B.	\$ 4.50 @ 4.75

English Steel from Store.	
Per lb.	
Best Cast.	\$ 15
Extra Cast.	\$ 16 1/4
Swaged Cast.	\$ 16
Best Double Shear.	\$ 15
Blister, 1st quality.	\$ 12 1/4
German Steel, Best.	\$ 10
1st quality.	\$ 9
2d quality.	\$ 8
Sheet Cast Steel, 1st quality.	\$ 15
2d quality.	\$ 14
3d quality.	\$ 13 1/4

METALS.	
Tin.	
Banco, Pigs.	\$ 28
Straits, Pigs.	\$ 28
English, Pigs.	\$ 28 1/4
Straits in Bars.	\$ 24

Tin Plates.	
Charcoal Plates.—Bright.	
Per box.	
Molyn Grade.	
IC, 10 x 14.	\$ 5.75 @ 5.80
IC, 12 x 12.	\$ 6.00 @ 6.25
IC, 14 x 20.	\$ 6.75 @ 6.80
IC, 20 x 28.	\$ 12.00 @ 12.50
IX, 10 x 14.	\$ 7.25 @ 7.50
IX, 12 x 12.	\$ 7.50 @ 7.75
IX, 14 x 20.	\$ 7.25 @ 7.50
IX, 20 x 28.	\$ 15.00 @ 15.50
DC, 12 1/2 x 17.	\$ 5.50 @ 5.75
DX, 12 1/2 x 17.	\$ 7.00 @ 7.25
Call and Grade.	
IC, 10 x 14.	\$ 6.75 @ 6.80
IC, 12 x 12.	\$ 6.00 @ 6.25
IC, 14 x 20.	\$ 6.75 @ 6.80
IX, 10 x 14.	\$ 7.25 @ 7.50
IX, 12 x 12.	\$ 7.50 @ 7.75
IX, 14 x 20.	\$ 7.25 @ 7.50
IX, 20 x 28.	\$ 15.00 @ 15.50
Allaway Grade.	
IC, 10 x 14.	\$ 5.00 @ 5.12 1/2
IC, 12 x 12.	\$ 5.25 @ 5.50
IC, 14 x 20.	\$ 5.00 @ 5.12 1/2
IC, 20 x 28.	\$ 11.00 @ 11.50
IX, 10 x 14.	\$ 6.00 @ 6.25
IX, 12 x 12.	\$ 6.25 @ 6.50
IX, 14 x 20.	\$ 6.00 @ 6.25
IX, 20 x 28.	\$ 12.00 @ 12.50
DC, 12 1/2 x 17.	\$ 4.75 @ 5.00
DX, 12 1/2 x 17.	\$ 5.75 @ 6.00

Coke Plates.—Bright.	
Per box.	
Steel Coke.—IC, 10 x 14, 14 x 20.	\$ 4.75 @ 5.00
10 x 20.	\$ 7.25 @ 7.50
20 x 28.	\$ 9.75 @ 10.25
IX, 10 x 14, 14 x 20.	\$ 5.50 @ 5.75
BV Grade.—IC, 10 x 14, 14 x 20.	\$ 4.40 @ 4.60
Charcoal Plates.—Terns.	
Dean Grade.—IC, 14 x 20.	\$ 4.40 @ 4.62 1/2
20 x 28.	\$ 9.00 @ 9.25
IX, 14 x 20.	\$ 4.40 @ 4.58 1/2
20 x 28.	\$ 11.00 @ 11.37 1/2
Abecarns Grade.—IC, 14 x 20.	\$ 4.25 @ 4.50
20 x 28.	\$ 8.50 @ 9.00
IX, 14 x 20.	\$ 5.25 @ 5.50
20 x 28.	\$ 10.50 @ 10.80

Tin Boiler Plates.	
XXX, 14 x 20.	112 sheets @ \$12.50 @ \$12.75
XXX, 14 x 28.	112 sheets @ 12.75 @
XXX, 14 x 41.	112 sheets @ 14.25 @

Copper.	
Burr's Pig. Bar and Ingot, 4¢; Old Copper, 3¢	
Manufactured (including all articles of which Copper is a component of chief value), 4¢ 3/4 ad valorem.	
Ingot.	
Lake.	@ 17
"Anchor" Brand.	@ 16 1/4

Sheet and Bolt.
Prices adopted by the Association of Copper Manufacturers of the United States, December 10, 1887, being quotations for all sized lots.

Weights per square foot and prices per pound.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
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THE IRON AGE

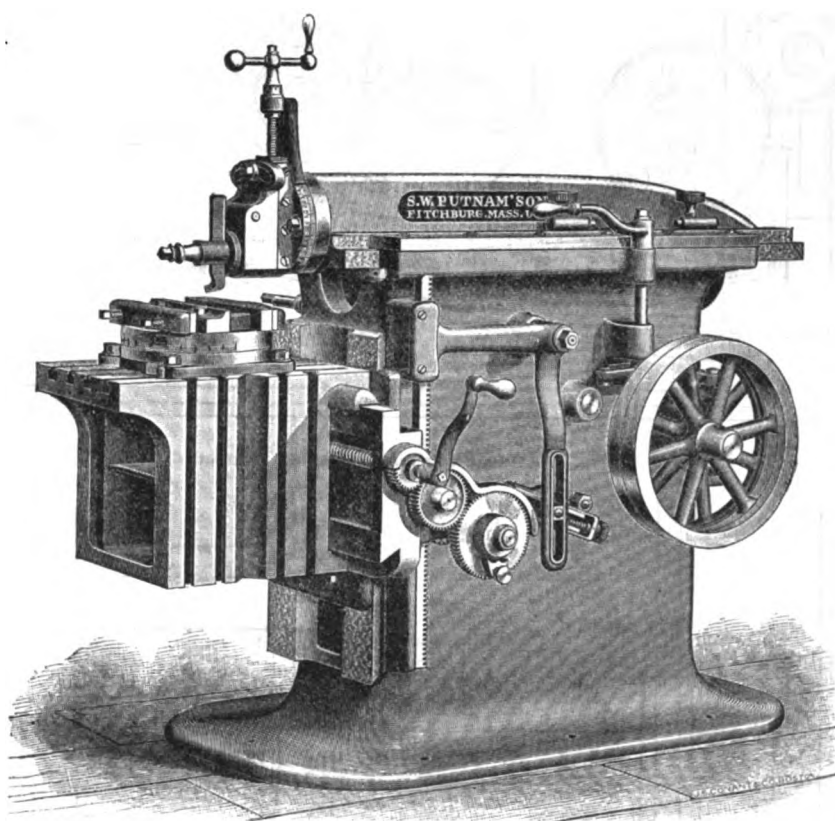
THURSDAY, FEBRUARY 28, 1889.

Shaping Machine.

The machine which we herewith illustrate in perspective and detail is compact and powerful, susceptible of fine and positive adjustments, practically noiseless, and operates with ease and smoothness. It is driven by straight and cross-belted friction pulleys located on each side of the machine. The power and velocity of the ram are unvaried by change of stroke, which can be regulated while the machine is in motion, its velocity at all times being uniform and under full control of the operator. By a new arrangement of motive parts the machine is self-adjusting as to wear and automatically absorbs power according to the resist-

quickness of the change in direction of the movement of the ram, which will work up to a line and reverse inside of $\frac{1}{4}$ inch. Shafting or bars of any length and up to $2\frac{1}{4}$ inches in diameter can be passed through the machine, under the ram and slotted or fluted at any point, and from $\frac{1}{2}$ to 15 inches in length, without change. The friction box for operating the feeds has a cam let-off and consumes power only at the instant of action. In the accompanying engravings, Fig. 2 is a side elevation showing the gears driving the ram and the feed gears, Fig. 3 is a plan view of Fig. 2, and Fig. 4 shows the construction of the driving shaft. This shaft consists practically of a hollow shaft, within which fits a spindle. To each end of the spin-

low shaft and being secured in the spindle. The spiral gear is thus free to move and to carry with it the inner shaft and also the driving pulleys P, mounted at either end of the inner shaft, and which are adapted to engage with the outer surfaces of the friction pulleys p. This spiral gear engages a gear connected with the driving train. These spirals are of 12° . It is evident from this construction that as the load upon the train increases the spiral gear J upon the shaft will be shifted along the shaft one way or the other, according to the direction in which the ram is moving, and will bring into play one or the other of the friction-wheels p. It is further evident that as the load increases the more powerful will be



SHAPER, BUILT BY THE PUTNAM MACHINE COMPANY OF FITCHBURG, MASS.

ance of the cutting tool—in other words, when the cut is exceptionally heavy and more power is consequently needed to drive the tool, it is obtained by means of an extremely simple arrangement, which we shall describe more in detail later. The ram is long, has a quick return, and is actuated by a powerful train of heavy gearing made in duplicate, the under surface of the ram being formed with two racks, with which the driving gears engage. The ram head is graduated, swivels on trunnion, is secured by T bolts to the ram, and has depth gauge, with a run of $5\frac{1}{4}$ inches. As stated, the driving gears are double, and so arranged that the cogs of one machine overlap the other. This imparts a smooth and even motion to the ram, and greatly promotes the endurance of the gears.

The machine has two speeds (for cast iron and steel), which admits of instant use without change of belt. Sufficient power is obtained to sustain a heavy cut, and an automatic coarse surfacing feed is provided. An important feature is the

dle is held a pulley, one of which operates the forward stroke of the ram and the other the return. The diameters are different, so as to get a quick speed on the return. Each pulley is mounted so as to revolve freely upon the hollow shaft, being held to the spindle by an arrangement shown in Fig. 5. Fitting a thread in the end of the spindle k is a nut, n, which holds the disk m in position. The hub o of the pulley is free to revolve on the hollow shaft. The hub is formed at its outer end with a thread, upon which fits the cap l, thereby forming an annular bearing about the disk m, so that while the pulley is free to revolve upon the hollow shaft, it is held in place by means of the disk m and the nut n to the spindle k. Fitting within the inner periphery of each pulley P is a friction pulley, p, mounted upon the hollow shaft with which it is rigidly connected. The spiral gear J is mounted about at the center of the driving shaft, and its extended hub is provided with a slot, j, through which passes a key, this key passing through a slot in the hol-

the thrust of the pinion J along the shaft, and the tighter will be the frictional hold between the pulleys p and P.

Fulcrumed at h, Fig. 8, on the side of the machine, is the lever H, the free end of which is formed with a yoke, as shown in the plan. In the free end of the yoke is pivoted a rod, the other end of which is provided with a standard having an arm adapted to engage with the usual tappets placed on top of the machine and carried by the ram. Pivoted a short distance from the fulcrum of the arm H is a rod extending through the case and carrying the friction arm, which is so arranged that any movement it makes in a direction parallel to the axis of its shaft will impart a similar movement to the spiral gear J. This arm, shown detached in Fig. 6, is of case-hardened malleable iron, and is provided with plugs of raw hide upon each side. As the ram moves forward its tappet strikes the upper projecting rod of the lever H and moves the rod entering the case, and therefore the spiral pinion

and its inner shaft or spindle, in a direction to throw out the driving pulley. At the reverse end of the stroke the mechanism takes the opposite course and

the lever H need be moved but a fraction to accomplish the movement of the spiral gear and the throwing out of the friction clutches. It is apparent that the heavier the

ing shaft to the ram and also to the feed mechanism, which latter is driven through the segmental arm B, thus engaging with the rack D, which drives the train B F G

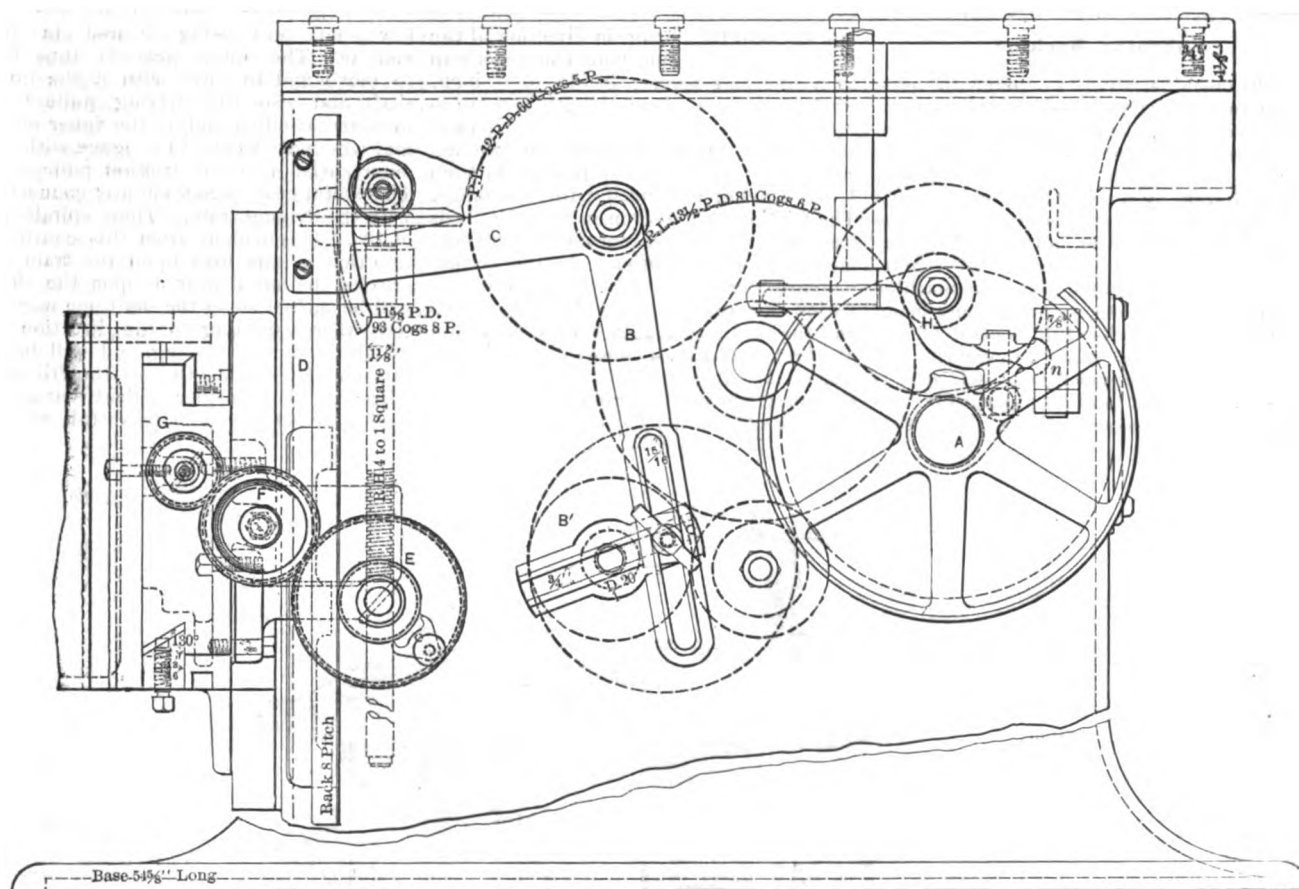


Fig. 2.—Side Elevation of Putnam Shaper.

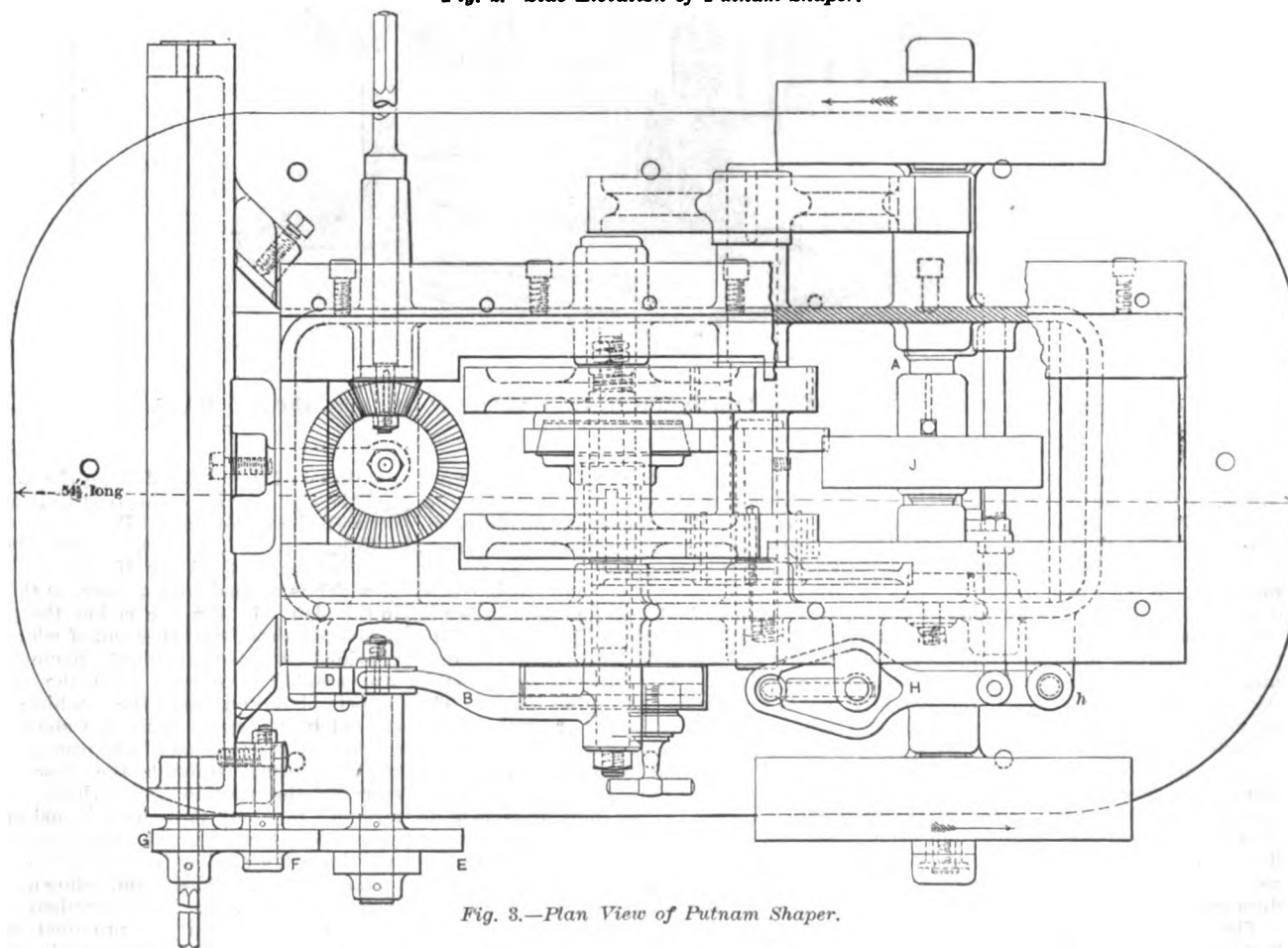


Fig. 3.—Plan View of Putnam Shaper.

relieves the friction from the pulley at the other end of the driving shaft. This mechanism permits of the working of the ram at an exceptionally short stroke, since

load the more powerful will be the force moving the spiral along the shaft and engaging the driving friction. In the side elevation, Fig. 2, are shown the trains from the driv-

operating the feed. The friction box operating this gearing consumes power only at the instant of action. From the brief description we have given of the

operating parts of this machine it will be seen that it is especially adapted for heavy work, that provision is made for compensating all wear of the frictional surfaces, and that it is so proportioned and designed as to work with the least possible time consumed by loss of stroke. The machine is unusually heavy and compact, and, possessing the admirable features we have mentioned, is rapidly making a place for itself in the long line of well-known tools coming from the Putnam shops. In an early issue we shall describe the rack-cutting attachment, designed to be used in connection with this shaper. This attachment can be placed on the shaper, with whose operation it will not in the least interfere, and at any time it can be used for the cutting of racks of any length. These

valued, as it is understood, at about or over \$1 per pound, is not the "steel strips" which pay 3½ cents per pound when valued at over 10 cents per pound, and 45 per cent. ad valorem when valued at under 4 cents per pound. This provision is evidently not applicable to such highly polished and finished merchandise as the article in question.

DUTY ON SWIVELS.

On an appeal from an assessment of 45 per cent. ad valorem on certain swivels, claimed to be dutiable under the provisions for "chain or chains of all kinds," the Department says: "The appraiser reports that the articles consist of a loop and swivel, having three or four short links of chain attached, and intended to be used, in connection with a leather strap, as a

still others four, strands of steel wire, also heavily covered with manila yarn, some of the latter being coated with tar and some not so coated. The merchandise not being the steel wire of commerce "covered with cotton, silk or other material," and not being the iron or steel wire rope also specified, and also being not otherwise enumerated, is dutiable at the rate of 45 per cent. ad valorem for "manufactures, articles or wares not specially enumerated or provided for * * * composed wholly or in part of * * * steel," &c., and the principle enunciated in the Department's decision, wherein it was held that certain "wire ribbon," which was a woven fabric consisting of fine wires covered with cotton thread and united together by a cotton web, was not the iron or steel wire covered with cotton, silk or

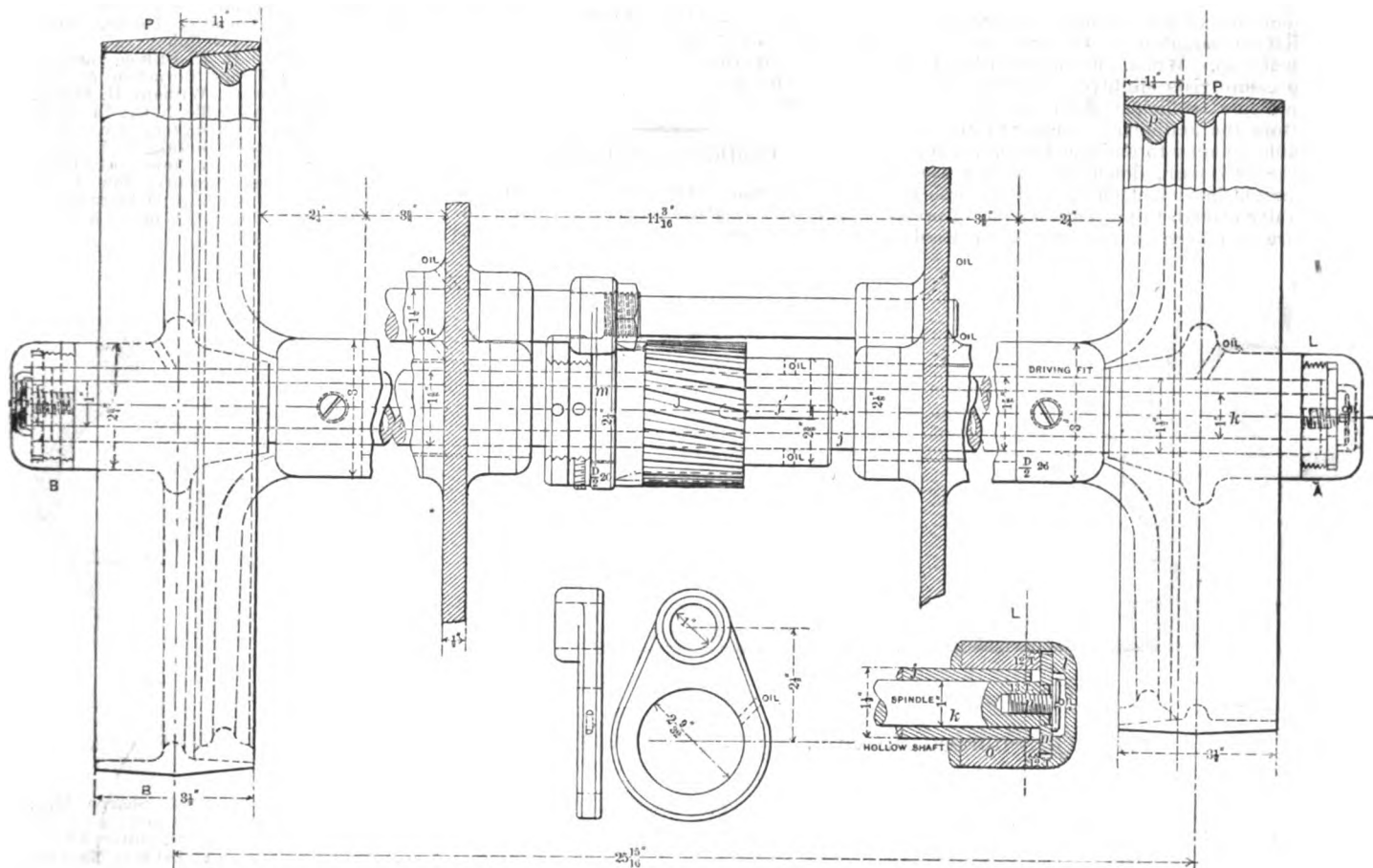


Fig. 4.

Fig. 6.

Fig. 5.

Figs. 4 to 6.—Driving Shaft of Putnam Shaper.

machines are built by the Putnam Machine Company, of Fitchburg, Mass.

Recent Customs Decisions.

The Secretary of the Treasury has announced the following decisions in customs cases under the metal schedule:

STEEL IN STRIPS.

The Treasury Department declines to reverse its decision whereby certain thin polished strips or tapes of steel were held to be dutiable at the rate of 45 per cent. ad valorem, for "steel not specially enumerated or provided for." From the statement, as well as that of the manufacturer, it was clear that the merchandise had, by the process of filing, polishing, &c., become, if not wholly, at least "partially," manufactured articles of steel, so that even if not covered by said provision it would be dutiable at the rate of 45 per cent. ad valorem. At any rate, the said merchandise, which, in many cases, is

patented article for fastening dogs, and that they are not, in his opinion, the 'chain' or 'chains' of commerce. From an examination of the sample submitted, the Department is of opinion that the articles are parts of chains, and that they were properly dutiable as claimed."

BUOY AND GRAPNEL ROPE.

On an assessment of duty at the rate of 45 per cent. ad valorem on certain so-called "steel wire covered with yarn," which the appellant claims to be dutiable at the rate of 6½ cents per pound, for steel wire galvanized, &c., the Department rules: "It appears from the report of the appraiser and an inspection of samples that the merchandise in question is not wire as commercially known and recognized, but that it consists of rope (styled by the appellant grapnel rope and buoy rope) composed of wire and manila yarn, some of the coils being composed of single pieces of galvanized steel wire heavily covered with manila yarn and coated with tar, and others containing three, and

other material as specified in said schedule.

DRAWBACK ON STEEL NAILS.

The Department in an application for drawback on certain steel nails has decided that on the exportation of steel nails manufactured wholly from imported steel slabs a drawback will be allowed equal in amount to the duty paid on the imported material used in the manufacture, less the legal retention of 10 per cent. The quantity of the material so used to be determined by adding to the net weight of the exported nails 7½ per cent. of such net weight.

Lord Stanley, Governor-General of Canada, advises that all Canadian fortifications be supplied with guns similar to those mounted in Halifax. So far from approving of this action, the Imperial Government, according to an Ottawa dispatch, remonstrates in imperative terms against the hostile policy pursued of late by the provincial authorities.

Pressure Regulator.

The safety pressure regulator here shown is especially designed for use in connection with a system for a public service of natural gas. It consists in a valve controlled and opened and closed by the shifting of a body of fluid which is moved by the pressure of the gas. The body of fluid is introduced into chambers, between which it is free to flow through the flexible pipe connecting them. The device is set so that under the average pressure of gas the fluid will be sustained in a state of about equal division between the two chambers; then, if the pressure drops a little in the outlet pipe, the pressure on the fluid will be proportionately relieved and enough fluid will gravitate from the movable chamber into the stationary chamber to sufficiently lighten the former to permit the weight to lift it, and hence the valve-arm, so as to open the valve wider and correct the variation in pressure by letting enough more gas pass the valve to make up. When, on the other hand, the pressure rises slightly above the average pressure, sufficient fluid will be forced from the stationary chamber to the movable chamber to pull the latter, and hence the valve-arm, down by the increase of weight in such chamber, and so close the valve enough to prevent increase of pressure and keep the amount of gas passing

gas-main and turning it on again without the consumer's knowledge. In case there should be a dangerous overpressure of gas, the entire amount of fluid will be forced into the movable chamber, which will then overbalance the weight and pull down the valve-arm so as to entirely close the valve. But as the pressure reduces, the fluid will flow back into the stationary chamber and permit the weight to lift the movable chamber and arm, and thus automatically open the valve. The regulator has therefore the three-fold function of compensating for variations of pressure in the ordinary use of the gas, in shutting off the gas so that it must be turned again personally by the consumer when it is turned off in the main line, and, also, in shutting it off entirely when the pressure is so excessive as to be dangerous or inconvenient. The arrangement of passages and connections is such that no fluid can remain in them, thus giving absolute freedom from frost. Owing to the parts being all of metal, the operation is no more affected by fire than are the pipes or connections. This regulator is being made by Adams Bros. & Co., of Findlay, Ohio.

Exhibitors at Paris.

The efforts of the American Commissioners of the Paris Exposition appear to have led to success, the number of manu-

Ohio; Union Metallic Cartridge Company, New York; Winchester Repeating Arms Company, New Haven, Conn.

Boilers.—E. P. Brown, Flushing, N. Y.; Hopson & Chapin Mfg. Company, New London, Conn.

Drills.—American Diamond Rock Boring Company, New York; Ingersoll Rock Drill Company, New York.

Carpenters' Tools.—Darling, Brown & Sharpe, rules, &c., Providence, R. I.; E. E. Gayland, saws, planes, &c., Bridgeport, Conn.

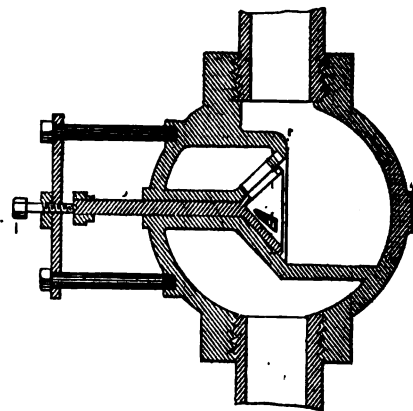
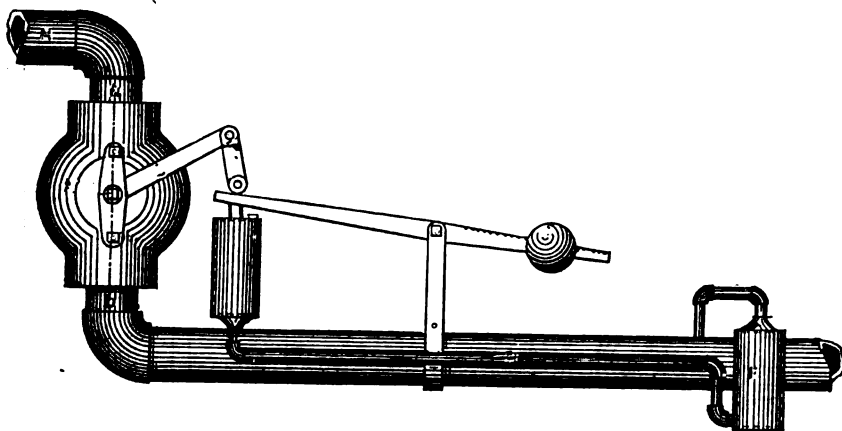
Engines.—John Henry Blake, marine rotary, New York; Crist & Covert, gas, New York; N. Huntley Edgerton, Philadelphia; J. Willis Morris, New York; Simonds Manufacturing Company, New York; Straight Line Engine Company, Syracuse, N. Y.; George W. Tift Sons & Co., automatic, Buffalo.

Glues.—Le Page & Co., Boston; Mrs. Christine Lugano, Kingston, N. Y.; Russia Cement Company, Gloucester, Mass.

Hardware.—Stanley Works, New Britain, Conn.; L. & J. White, tools and knives, Buffalo, N. Y.

Road Machines.—American Road Machine Company, Kennett Square, Pa.; Brooklyn Railway Supply Company, New York; Gendron Iron Wheel Company, Toledo, Ohio; George N. Pierce & Co., Buffalo.

Railway Supplies.—D. E. Bishop, railroad joint, New York; Henry Bornstein & Co., patent pin hook, Boston; William H. Inloca, model of turntable, Asheville, N. C.; Dr. B. F. Laird, car coupling, Covington, Ky.; New York Car Wheel Works, Buffalo, N. Y.; New York Commercial Company, New York; Peckham Paper Car Wheel Company, New York; H. K. Porter & Co., Pittsburgh; John Stephenson Company, New York; A. Whitney & Sons, car wheels, Philadelphia.



RYDER PRESSURE REGULATOR, MADE BY ADAMS BROS. & CO., OF FINDLAY, OHIO.

into the outlet pipe nearly constant. It will be seen that the fluctuations in pressure in the gas supply at once act through the movable fluid to operate the valve in compensatory action, so that although variations of pressure occur in the gas main, the pressure of gas passing through the outlet pipe will be constant. In case the gas should be entirely shut off in the gas main, all the fluid will then at once gravitate into the stationary chamber, leaving the movable chamber so light that it is overbalanced by the weight and lifted until the valve-arm rotates the valve so as to entirely close it. It will thus be seen that the shutting off of the gas in the gas-main is followed by the automatic closing of the valve. The regulator acts as a visual indicator to signal to the consumer that the gas has been shut off in the main line. Now, although the gas may be turned on in the main line, none will pass into the outlet pipe until the consumer has manually opened the valve by lifting the weighted lever, which he must hold in an elevated position against the weight until the pressure of the gas thus let into the outlet pipe, and hence into the stationary chamber, has forced enough liquid into the movable chamber to balance the weight and keep the valve open. It will be evident from the foregoing that the device constitutes a safeguard against accident due to shutting off the gas in the

facturers to whom space is allotted being very large. The commissioners have assured exhibitors that every possible care will be taken to display to the best advantage whatever may be sent. There will be no expense for freight charges either going to France or returning, but exhibitors are expected to provide packing for their goods, and to attach to the various exhibits cards stating the insurable value of the goods. They must agree also not to offer any of the exhibits for sale during the progress of the exhibition, and not to withdraw any of them during that time. Space has been allotted thus far to the following firms:

Agricultural.—S. L. Allen & Co., seed drills, Philadelphia; Egbert Benson, cultivator, Raritan, N. J.; Columbia Agricultural Works, Columbia, Pa.; Cyclone Pulverizer Company, New York; Enterprise Mfg. Company, feed grinders, Columbiana, Ohio; Genesee Valley Mfg. Company, drill, corn-sheller, &c., Mount Morris, N. Y.; Higginum Mfg. Corporation, Higganum, Conn.; J. Moore's Son, rakes and forks, New York; Thornton N. Motley, wheelbarrows, New York; A. G. Peck & Co., axes, Cohoes, N. Y.; Strickler Brothers & Co., butter coloring, Sterling, Ill.

Ammunition, Cannon, Guns, &c.—Bailey, Farrell & Co., Pittsburgh, Pa.; E. P. Brown, Flushing, N. Y.; Colt's Patent Firearms Mfg. Company, Hartford, Conn.; Hurst Reinforced Cartridge and Arms Company, Washington, D. C.; Pneumatic Dynamic Gun Company, New York; Smith & Wesson, Springfield, Mass.; Standard Target Company, Cleveland

Mill Machinery.—Brown & Sharpe Mfg. Company, Providence, R. I.; Curtis & Curtis, Bridgeport, Conn.; A. Heine, Silver Creek, N. Y.; Higley Sawing and Drilling Machine Company, Boston; E. Horton, Son & Co., Windsor Locks, Conn.; Simeon Howes, Silver Creek, N. Y.; Klauder & Bro., Philadelphia; F. W. Leinbach, Bethlehem, Pa.; V. W. Mason & Co., Providence, R. I.; William Sellers & Co., Philadelphia; D. E. Whiton Machine Company, New London, Conn.

Mowing Machines.—Bradley & Co., Syracuse, N. Y.; Samuel Johnston & Co., Brockport, N. Y.; McCormick Harvesting Company, Chicago; D. M. Osborn & Co., Auburn, N. Y.

Harvesters.—Johnston Harvester Company, Batavia, N. Y.; Pland Mfg. Company, Chicago; Walter A. Wood Company, Hooick Falls, N. Y.; William N. Whitely Company, Springfield, Ohio.

Stoves, Ovens, &c.—McDowell Oven and Furnace Company, Boston; A. Reid, Buffalo.

Machinery Aids.—American Bit-Brace Company, Buffalo; A. Christoffel, boiler tube scraper, Brooklyn; F. S. Fease, lubricating oils, Buffalo.

Machinery of Various Kinds.—Wilson Ayer, rice machines, Camden, N. J.; Burton Fils, emery wheels, Paris; Chambers Brothers, brick-tempering machine, Philadelphia; J. H. Eaton, plaiter for dress trimming, Monroe, Wis.; Energy Manufacturing Company, rope hoists, Philadelphia; J. D. C. Knapp, vaporizers, Minneapolis, Minn.; Michigan Radiator and Iron Mfg. Company, Detroit, Mich.; W. E. Morgan, numerating machines, Chicago; T. W. Norman, rope-laying machine, Boston; John E. Smith, machine for cutting meat, Buffalo; Stiles & Parker, drop hammers, Middletown, Conn.; Teal Hoist Company, patent hoists, Philadelphia.

Machinery Packings.—United States Metallic Packing Company, Philadelphia.

Mechanics' Tools.—Billings Spence Company, Hartford, Conn.; L. S. Starrett, Athol, Mass.

Locks.—Miller Lock Company, Pabita, Pa.; Yale and Towne Mfg. Company, post-office outfit, Stamford, Conn.

Laundry Machines.—Bailey Wringing Machine Company, Woonsocket, R. I.; Charles A. Bentzen, New York; A. M. Dolph Company, New York; Empire Granite Company, New York; Empire Wringing Company, Auburn, N. Y.; Gowans & Stover, Buffalo; D. K. Hickok, Morrisville, Vt.; C. Mears & Son, Bloomsburg, Pa.

Lawn Mowers.—Chadborn & Coldwell Mfg. Company, Newburg, N. Y.; Lloyd Hardware Company, Philadelphia.

Leather Goods and Belting.—American Leather Link Belting Company, New York;

Riveting Machines.

The gradual advance in forging, from the old sledge wielded by brawny arms to the power and steam hammer of to-day, is well known to every manufacturer, but until 25 years ago little advance had been made over riveting by hand; drop and foot presses have been tried, but the force of the blow expanded the rivet the whole length. The inventor of the machine here illustrated then became convinced that the best results could only be attained by a succession of sharp, quick blows given in the least possible time. After considerable experimenting the principles embodied in this machine were adopted, and

stantly. The blow is rendered elastic by the springs in connection with the air-cushions, and its force can be regulated at the will of the operator by more or less pressure applied to the treadle at the right of the machine; the yoke to which the treadle is attached is self-acting, and the moment the pressure is removed the blows cease and the work can be withdrawn. Suitable devices for holding the work firmly can be attached to the adjustable anvil and connected with the treadle at the left of the machine, so as to be operated by foot if desired. The work being held firmly on the anvil directly under the hammer, the hammer always strikes on the rivet, heading it equally, and as it is rotated while the blows are being struck the head conforms to the shape of the peen of the hammer, and any style of head can be formed. Both hands of the operator being free, he is able to handle the work with ease and rapidity.

Fig. 1 represents the form of machine generally used, and is adapted to all ordinary work, but where more room is required between the anvil and the hammer the base of the machine is changed, as shown in Fig. 2, and can be furnished in various heights with a detachable anvil. When made for agricultural wheels or articles of that height it will answer for all classes of work, but is not recommended for continuous use in general riveting, as the peen of the hammer is so high that the operator must work on a platform in order to be on a level with the hammer, which necessitates raising all of his work to the same height. In Fig. 2 no treadle is shown to operate attachments on the anvil, but when required it will be furnished. In riveting the hubs of wheels or larger articles where much horizontal room is required a machine embodying the upper working parts only can be furnished, and this suspended by a framework from the ceiling will allow of riveting on the surface of work of any diameter.

The machines are made by John Adt & Son, New Haven, Conn., in six sizes—viz., $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$ and 1 inch, each machine being capable of working rivets of the diameter given and many sizes smaller.

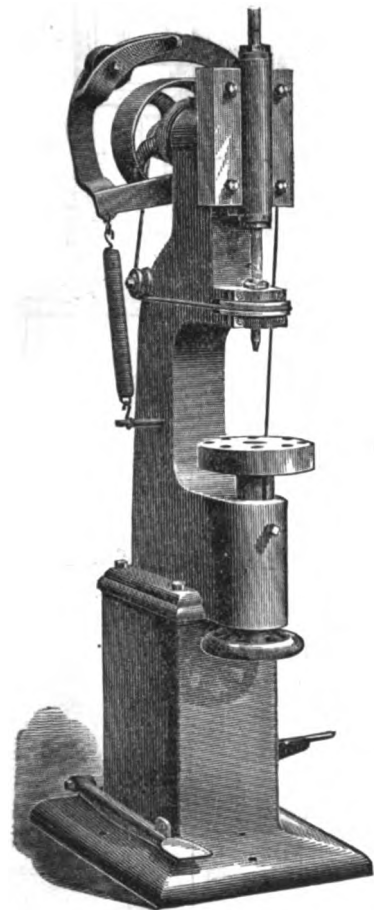


Fig. 1.

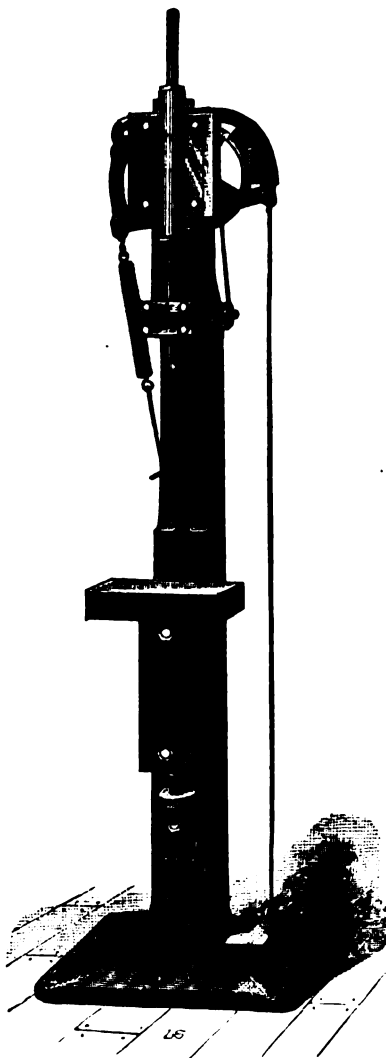


Fig. 2.

RIVETING MACHINES BUILT BY JOHN ADT & SON, OF NEW HAVEN, CONN.

R. Hoffeld & Co., Buffalo, N. Y.; Leopold L. Lowenheim, New York; F. Osborn, Jr., & Co., Boston; George H. Russell, Newburg, N. Y.; R. G. Salomon, Newark, N. J.; Charles A. Schieren & Co., New York.

Household Utensils.—H. M. Dopp & Son, iron kettles, Buffalo; F. A. Frank, cook stove, New York; George A. Macbeth & Co., lamp chimneys, Pittsburgh; Kellogg & McDougall, brooms, Buffalo; Joseph Noyes & Co., clothes fasteners, Binghamton, N. Y.; Henry Nutrizio, coffee pots, New York; W. H. Pike, self-pouring teapot, New York; A. H. Reid, butter worker, Philadelphia; Sidney Shepard & Co., sifter, knife, &c., Buffalo, N. Y.

Hydraulic Rams, Pumps, &c.—W. B. Douglas, Middletown, Conn.; Silver & Deming Mfg. Company, Salem, Ohio; Worthington Pumping Engine Company, New York.

Nails.—Ausable Horse Nail Company, New York.

Secretary Whitney has given the new dynamite gun the stamp of his official approbation, the recorded result of tests made being pronounced satisfactory.

although many changes and improvements have been made, machines that were then manufactured and which have been in continuous use for over 20 years are still doing the work satisfactorily.

The elastic rotary-blow riveting machine, Fig. 1, was originally designed to rivet together articles of hardware, but its use has from time to time been extended to almost every branch of manufacturing where articles are held together by rivets, and it is now widely used in establishments where its utility has become known. The most important feature of the machine is in the combination and working of the cylinder and hammer-rod. The hammer-rod, suspended by springs and confined air within the cylinder, partakes of its reciprocating motion and produces a sharp, quick blow, which with its rotating action enables the machine to perform the work almost in-

The freight agents at Pittsburgh of the various lines having connections with that city have been at work for some time on a new form of freight tariff, which will prove a great advantage to shippers when wanting information in regard to the rate to any point mentioned in the tariff. At present the rate is given with the name of each point of shipment, thus requiring a vast amount of unnecessary repetition. To find the rate it is necessary to refer to the index to find the page in the tariff list. The new form does away with an index entirely. The name of each place to which merchandise is shipped from Pittsburgh is given in alphabetical order. For instance, if the rate on any class of merchandise from that city to Chicago is wanted, by reference to the alphabetical list the name of the road over which the goods will be shipped is given, and also the number of that city, which is 100. All that is then necessary to find the rate is to refer to the table of rates, which is printed on one page. The simplicity of the new form can be seen at a glance by reference to the following illustration, taking Chicago as an example:

Chicago, Ill. | L. S. M. S. | 100
This shows the city, State, railroad over which merchandise can be shipped, and the number for the table of rates. The table of rates is illustrated as follows:

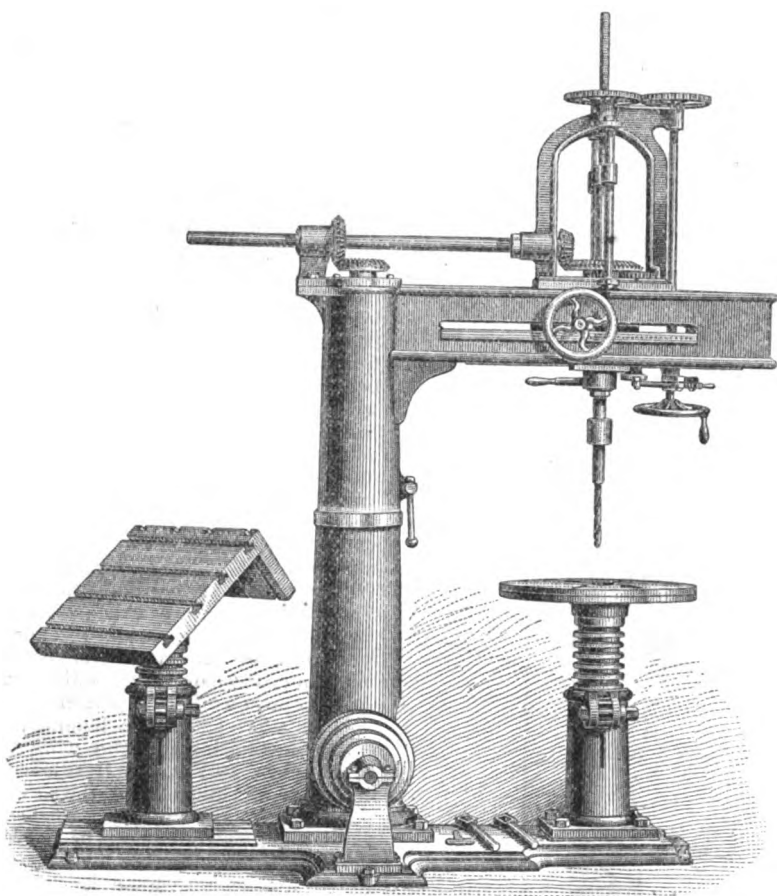
No. 100.	1	2	3	4	5	6
	42½	37½	27½	20	17½	15

The number 100 indicates the city, the top line of figures shows the various classi-

fications of freight, and the lower line of figures shows the rates per 100 pounds on the different classes of freight. This new

tached to the vertical shaft G' , whose lower end is provided with a hand-wheel, G'' . The cross-head H , which moves upon

threads on the lower end of the feed-screw are much finer than those on the body of the screw. Beneath the recess h



THE KEYSTONE RADIAL DRILL.—PRENTISS TOOL & SUPPLY CO.,
NEW YORK.

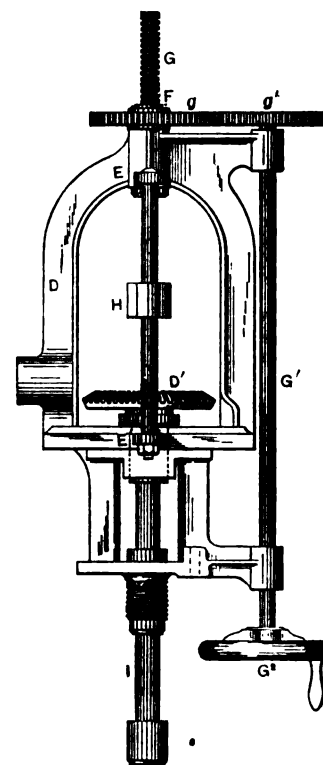


Fig. 2.

form of freight tariff will be put in operation some time during the early part of next month.

The Keystone Radial Drill.

This drill is intended for a large range of work. It will take in a pulley up to 4 feet in diameter, and will bore small cylinders and similar work. The screw will feed 14 inches, and has adjustable automatic feed. The circular table is 24 inches in diameter, and is bored to receive bushes for boring bars; it can be raised or lowered without being turned around. The square tilting table slips in the slotted side of the bed and can be quickly removed. The drill illustrated has a radius of 48 inches and will drill to the center of an 80-inch circle. The column is 12 inches in diameter and 6 feet high.

Fig. 2 of the drawings is a side view and Fig. 3 a vertical section of the drill-stock; Fig. 4 is a side view and Fig. 5 a sectional view of the tilting table and its support. Through the horizontal slot in the beam passes a shaft carrying a pinion and hand-wheel engaging with a rack so as to move the drill frame. The drill spindle is revolved from the cone pulley by gearing inclosed within the column and at the top of the beam, as shown in the perspective view. The drill frame is formed with laterally-projecting arms, $E E$, connected together by guide-rods. At the center of these arms are openings, in the lower one of which is journaled the hub of the beveled gear D' , while in the upper opening is seated an internal screw-threaded feed-nut, F , with which the feed-screw G engages. To the upper portion of the feed-nut is secured the pinion g , engaging with which is the gear g' at-

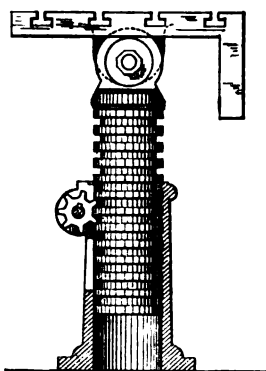


Fig. 5.

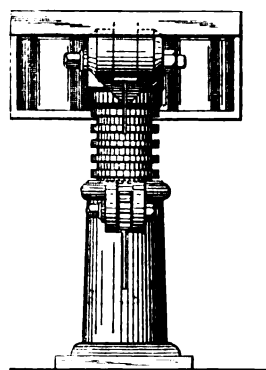


Fig. 4.

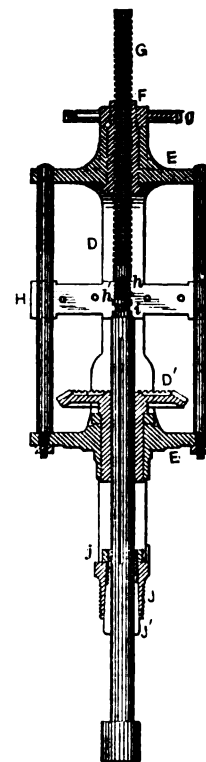


Fig. 3.

the guide-rods, has a central threaded socket, h , with which the lower end of the feed-screw engages. The and communicating with it is a recess i formed with an annular shoulder to engage a groove on the upper end of the spindle

I, which passes freely through the pinion D' to which it is splined. The lower cross-piece of the drill frame has a vertical conical socket, J, within which is seated a long split sleeve J', threaded at its upper end to receive the adjusting nut j. This sleeve forms the lower bearing for the spindle and may be adjusted vertically within its socket by means of the nut to take up wear. By supporting the spindle in this way the weight of the spindle and its parts does not come upon the drill, and drills of the smallest kind may be used without danger of breaking.

At one end of the platform of the drill is a stationary column carrying a vertically movable table which is rigidly at-

New Power Forging Drop Press.

The accompanying illustrations represent a new drop power forging press put upon the market by the E. W. Bliss Company, Brooklyn, N. Y. Fig. 1 shows the general appearance of this press, while Fig. 2 is a cross-section of the lifting device. The same concern are also just putting upon the market a similar press for sheet-metal stamping work, in which the gripping device is the same as in the forging press. As the two machines embody the same general features of construction, a description of one of them will suffice. The tool is a departure from the familiar types, in the direction of simplicity and

cessity of gearing. As no bolts or screw-threads are used in the construction of the lifter, there is nothing to jar loose. The only bolts used on the entire machine are those shown for securing the guides to the bed, and the nuts for these are placed in cored pockets in the bed and bear upon rubber washers. Several sizes of these tools are now in course of construction, the hammers weighing from 100 to 1000 pounds. The size represented in the cut has a 350-pound hammer, with 28-inch lift; complete weight, 4500 pounds.

One of the most remarkable engineering feats appears to have been achieved in China, in the face of extraordinary phys-

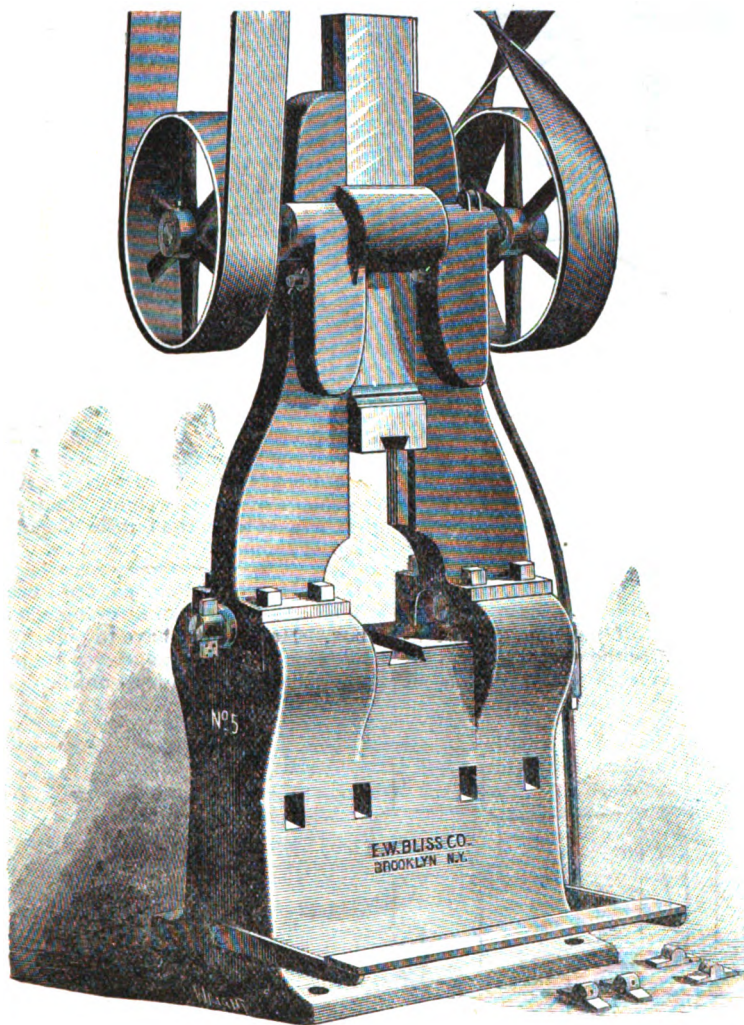


Fig. 1.—General View.

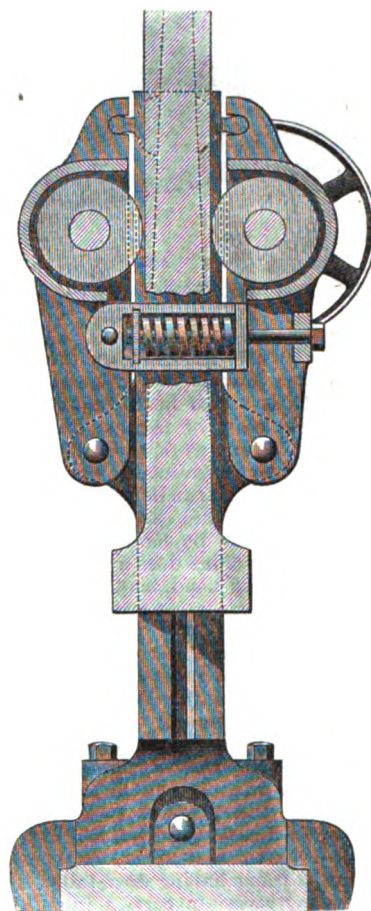


Fig. 2.—Sectional View, Showing Lifting Device

FORGING DROP PRESS, BUILT BY THE E. W. BLISS COMPANY, OF BROOKLYN, N. Y.

tached to a column having horizontal grooves with which engages a pinion carried by the outer column. The table can be adjusted vertically and turned horizontally. A second column, Figs. 4 and 5, may be moved toward or from the first and clamped in any desired position. The construction of this column is clearly shown in the drawings. The table can be raised to any height and adjusted to any desired angle.

This drill is built by the Prentiss Tool and Supply Company of 42 Dey street, New York.

Charles Pratt, the wealthy oil manufacturer of Brooklyn, on Friday, 22d inst., formally presented to Adelphi Academy the new wing to be known as the Collegiate Building, which has been erected at a cost of \$160,000. It is fireproof throughout.

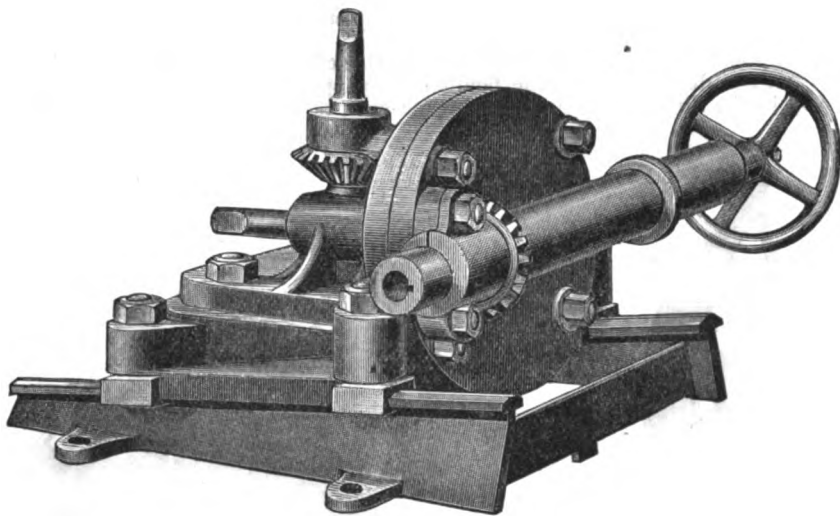
small number of parts, and in order to fully test its merits and discover possible defects before offering it for sale, it has been run continuously for about six months in making drop forgings. This test has led to a few minor changes, the final result being embodied in the machine as illustrated. The principal feature is the peculiar shape of the hammer, which is essentially nothing more than a steel billet placed on end and hammered out at the bottom to give proper support to the die. This construction concentrates the blow upon the work, gives very long guides for the hammer, and makes a very strong and durable arrangement. The lifting rolls are carried in housings, as shown, and work directly against the face of the hammer, and the details are so arranged that no adjustments on account of wear are necessary. Each roll is driven by an independent pulley, thus avoiding the ne-

ical difficulties—namely, the successful stretching of a steel wire cable of seven strands across the river Lunann, this feat having been accomplished by the Danish engineer Delinde, assisted only by unskilled native labor. The cable extends between two points, at a distance of nearly 4700 feet apart, the height of the first support being about 450 feet above the present level of the river, and the second about 740 feet. The cable in question is said to be the longest in the world, with a single exception—namely, the cable across the Kistna, measuring some 5070 feet. There are also two cables across the Ganges, of 2900 and 2830 feet respectively.

An El Paso dispatch says a Scotch firm will erect large works in Mexico, probably at the capital, and that other British industries contemplate a similar move. Smelting works especially invite capital.

Drilling Machine and Link Miller and Slotter.

The engravings represent a horizontal and radial drilling machine and a link miller and slotter invented by P. Leeds, master mechanic Louisville and Nashville Railroad, and manufactured by Pedrick & Ayer, of Philadelphia, Pa. The drilling machine is designed to work on or from a



DRILLING MACHINE, MADE BY PEDRICK & AYER, PHILADELPHIA.

drill press. It is mounted on the frame and is driven direct from the drill-press spindle. It is useful in drilling the ends and diagonal parts of frames; it can also be mounted on the work and driven by a sliding shaft and universal joints. Drilling in all directions can be done with the two taper shanks and the horizontal and vertical movements by loosening the nuts shown. The machine does away with the ratchet worked by hand, and it is capable of drilling with as great speed as though drilled direct.

The link miller and slotter will mill out links to any desired radius. It is designed on the principle that the apex of any angle will touch or describe all parts of a circle whose versed line is equal to the perpendicular where the base is formed by the chord of the arc. It can be used on a good strong drill press or as an attachment to the heavy universal milling machine built by the same firm. It consists of a jointed frame having dove-tailed slots running lengthwise to carry a frame that has the link blank secured in it; this frame is actuated by the screw and hand-wheel and describes a circle, according to the angular position of the lower or jointed frame; flanges are cast on the bottom of this frame for the purpose of bolting down on the table or platen. In the center of the lower frame, at the center of the joint, is a bronze bushing that is set exactly under the center of the drill-press spindle; this serves as a lower support for a boring bar and the shank of the milling-tool arbor. In practice it is found more convenient to drill a hole in one end of the link to be slotted large enough for a boring bar to pass through, then by using a double-end cutter the slot is cut out to nearly the finished size; the link is then moved along $\frac{1}{8}$ or $\frac{1}{4}$ inch and is cut through again until the stock is removed; a milling cutter similar to a reamer is then used and the slot is finished to the radius for which the link is set. With this attachment a link 20 inches long is finished in about four hours.

In connection with the fifth annual meeting of the Ohio Gas-Light Association, at Mansfield, Ohio, March 20 and 21, 1889, there will be an exhibition of gas stoves,

engines, burners, electric motors and any and all kinds of apparatus and appliances of interest to gas men and the lighting fraternity. An exhibition of this kind was announced last year for the annual meeting at Sandusky, Ohio, and while it constituted an interesting feature of the meeting, it was only partially successful, on account of the extremely short notice that was given to manufacturers and dealers

who desired to display their goods. The present notification, however, is given sufficiently in advance to allow all who desire to do so ample time in which to prepare their exhibits and have them in position at the opening of the meeting. A large room for this display has been secured close to the place of meeting. Consignments of articles for the exhibition and inquiries for information as to details of

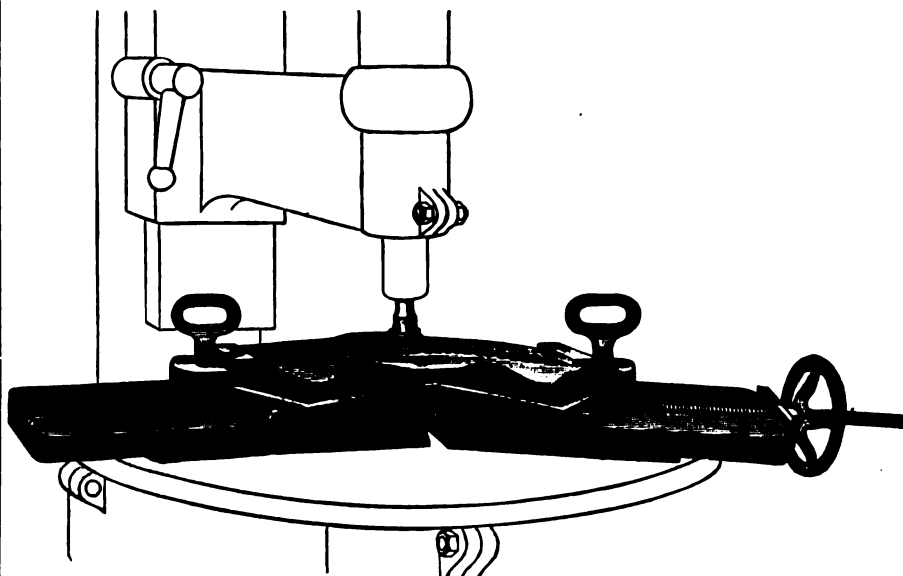
Cleveland Weighing Bureau.

The report of Holland W. Davis, joint weighmaster of the Cleveland Weighing and Inspection Bureau, from June 1, 1888, when the inspection began, to December 31, is given below. The Detroit and Cleveland Steam Navigation figures are from June 1 to October 31 only, the Cleveland and Canton from July 1 to August 21, and the Empire Line from November 1 to December 31. The figures given are in thousands of pounds:

	Ship's wt.	Act'l wt.	Excess.
Pennsylvania.....	49,215	55,000	7,444
L. S. & M. S.....	41,064	47,576	6,511
N. Y., C. & St. L.	24,260	27,283	3,023
N. Y., P. & O.....	8,215	9,253	1,038
C., C., C. & I.....	8,389	9,324	935
Valley.....	3,448	4,135	687
D. & C. Nav. Co.	361	444	83
Cleveland & C an-			
ton.....	210	253	43
Empire Line.....	189	154	14
Total.....	185,335	155,086	19,751

This excess of 9876 tons, discovered and corrected by the bureau, amounts to 13.85 per cent. of the freight inspected. Mr. Davis estimates that 60 per cent. of the excess discovered was fourth, fifth and sixth class freight, with an average rate of 10 cents per 100 pounds, and 40 per cent. first, second and third class matter, with an average rate of 15 cents per 100 pounds. At these estimates the excess tonnage discovered would amount to \$28,702; the estimated gain in changes of classification discovered is \$1306; deducting expenses of the bureau, \$3685; the net gain to the railroads for this period was, therefore, \$21,223. Mr. Davis says that the percentage of excess weights obtained is as great now as when the bureau began business last summer.

R. F. House, of Pomona, Cal., has contracted to sell his seedling oranges at \$1.10 a box. He does not have to pick, pack or haul any of the oranges. The pickers gathered 60 boxes of fruit on the first day



LINK MILLER AND SLOTTOR, MADE BY PEDRICK & AYER, PHILADELPHIA.

the arrangements must be sent to Geo. S. Harris, Superintendent Gas and Electric Light Companies, Mansfield, Ohio.

A committee of the National Board of Steam Navigation, of which President Cheney is chairman, will arrange the marine portion of the centennial celebration of the inauguration of President Washington.

from eight trees in their regular order in the orchard. The total value of the fruit picked that day is \$66. That is at the rate of \$8.25 per tree. There are 100 trees to an acre on the place, and at this rate an acre is worth \$825. The orange orchards of William O'Connor, Dr. Nesbit, James Loney, J. D. Cason and W. H. Woody, in the same locality, will produce the same handsome results.

THE WEEK.

The bill for the admission of four new States, North and South Dakota, Montana and Washington Territory, was signed by President Cleveland on Friday, in honor of Washington's Birthday, so that now 42 stars will represent the national Union. Dakota was organized as a Territory March 2, 1861. It comprises an area of 150,932 square miles. A special census, taken in 1885, showed a population of 415,610, and in 1887 the Governor estimated the population at 568,477. The total assessment of property in 1887 was \$157,084,865. Montana was organized as a Territory May 26, 1864. It comprises an area of 143,776 square miles. Its present estimated population is 175,000. The total taxable value of property in the State in 1886 was \$55,076,871. Washington was organized as a Territory March 2, 1853. It contains 79,994 square miles. By a census taken in 1887 it was shown to contain a population of 143,669.

According to the report of a Massachusetts legislative committee all the grade crossings of railroads in that State must be abolished. There are 2902 intersections of highways and railroads, and to carry out the purposes of the law would necessitate the expenditure of \$48,000,000.

A tugboat fireman was scalded to death in the boiler-room of the J. Jewitt, at Pier No. 18, East River. Becoming wedged in behind the boiler he broke the glass water-gauge and was enveloped by the escaping steam.

The "Young Napoleon of Finance," Henry S. Ives, and Geo. H. Stayner, a business partner, together with E. W. Woodruff, of Newark, N. J., whose exploits in connection with the affairs of the Cincinnati, Hamilton and Dayton Railroad startled the business world a few months ago, are now entangled in the meshes of the law. It is charged that when they failed, August 11, 1887, they owed \$16,000,000. President Dixon, who is now in this city, states that in addition to nearly \$3,000,000 received by them on deposit prior to August 1, being the proceeds of certain mortgage bonds issued for a specific purpose, Ives, Stayner & Co. appropriated to their own use \$624,900 worth of new stock issued for improvement purposes, \$65,000 worth of negotiable bonds, 8840 shares of the stock of the Terre Haute and Indianapolis Railroad, which belonged to the company, and \$10,000,000 of the preferred stock, which was issued in the names of clerks and book-keepers of the firm. On the day when they took \$6,000,000 worth of this stock, the firm, as shown by their books, had a cash balance of less than \$13,000, and at the close of the day's business only \$70,000. Yet on that day their liabilities were \$18,500,000, all payable on demand or at short notice. Ives and Stayner are in Ludlow Street Jail in default of \$50,000 bail.

The American minister to Japan has signed a treaty of commerce, amity and navigation with Japan, a copy of which will be forwarded and laid before the Senate.

The city of Bangor, in Maine, has a water system constructed by the Holly Company, of Lockport, N. Y., which drowns out fires without the need of engines. The water is taken from the Penobscot, $1\frac{1}{4}$ miles above the business center of the city, at which point a big dam was built across the river at an expense of \$250,000. The dam is 900 feet long, from 55 to 85 feet in breadth at the base, and has a sluiceway for rafts and logs 23 feet wide by 817 feet in length. The whole volume of the Penobscot falls

over this great dam, and when the river is at freshest pitch the sight there is grand. At the pumping station they have a 225-horse-power engine, which was used the first year the system was in operation, but ever since then water-power has been used exclusively, the five original wheels, with two recently put in, having a pumping capacity of 10,500,000 gallons daily, whereas only about 2,000,000 gallons are ordinarily needed. There are 25 miles of street mains in Bangor, besides several miles in the opposite town of Brewer, supplying 2700 water-takers and nearly 200 hydrants. To wet down church steeples or inundate the surrounding country it is only necessary to connect with the nearest hydrant.

A second electric street railroad was operated in Boston a few days ago, connecting Bowdoin square with Harvard square, in Cambridge. The roads are about to test the feasibility of the overhead system in crowded streets. Respecting the practicability of underground wires, the National Electrical Association, in session at Chicago, were almost equally divided. Although a committee previously appointed reported that conduits in almost every instance were a failure, Professor Barrett, of Chicago, said the underground system had proved to be an entire success. Mr. Johnson, of Philadelphia, said that the underground system was also in successful operation in the Quaker City.

Twenty carloads of agricultural machinery, valued at \$100,000, arrived in San Francisco last week from Madison, Wis., consigned to a single house. Another train of 20 cars loaded with steel-axle farm wagons will follow.

James C. Flood, of the once famous bonanza firm, Flood & O'Brien, whose estate in California is valued at between \$7,000,000 and \$8,000,000, died in Germany, February 21, of Bright's disease. He was born in New York City in 1826. Going to California in the early days of the mining excitement, he soon became associated with several leading speculators, and by obtaining control of valuable gold deposits on the Comstock lode, the partners ultimately took out \$300,000,000 of ore in the course of six years, each of them at one time taking out about \$750,000 in a single month. Their next step was to organize the Nevada Bank, with a paid-up capital of \$10,000,000. At a later day the bank became involved in the California wheat deal of 1887, in which the loss was about \$11,000,000, and Mr. Flood never recovered from the blow. His magnificent residence in San Francisco, completed in 1886, is said to have cost \$5,000,000, including its accessories. Flood & O'Brien's office in Wall street will be remembered as a resort for the *habitués* of that section, but without the least pretensions to elegance, its entire equipment consisting of little more than a desk and a few chairs.

Manufacturers in Pennsylvania protest against the imposition of the three-mill tax on the capital stock of manufacturing corporations. Among those who are most active in their opposition is H. W. Oliver, of Pittsburgh; Cyrus Elder, of the Cambria Iron Works; Lucinda Furnace Company and Jones & Loughlin, of Pittsburgh.

The Interstate Commerce Railroad Association, as now completed, comprises a membership of 18 roads out of the 22 which were originally deemed necessary to the adoption of the agreement. The principal company holding off is the Chicago, Burlington and Northern. It is stipulated that the agreement shall take effect immediately. Aldace F. Walker, of the Interstate Commission, was offered the chairmanship. The recent meeting of the trunk line presidents, in this city, resulted

in placing upon Commissioner Fink the duty of furnishing the Federal officers with all the evidence that he can secure to convict roads that violate the national law, and it is said that he is determined to act without regard to considerations of policy in a last desperate effort to induce the roads to maintain tariff rates and thereby secure remunerative returns to stockholders and stable rates for shippers.

A seam of coal took fire on the Cincinnati Southern Railroad, near Sunburnt, Tenn., caused by a collision of freight trains in a tunnel at that point. Some of the cars being loaded with oil, the flames communicated to seams of coal and timbers supporting the tunnel, burning fiercely. Walls were erected and the entrances closed up in the hope of smothering the flames. The loss is computed at \$425,000, including the cost of rebuilding.

The ceiling scandal, at Albany, has become notorious. The facts, briefly told, are that the old stone ceiling, which was considered unsafe, was removed and another substituted, but the contractors, taking advantage of the vague terms of the contract, put up a cheap ceiling and put in a bill for a good one. They ask \$270,000, and, as it has been shown by experts that the work cost only \$165,000, a clear profit of \$105,000 is the result. New York has been unfortunate in the building of its Capitol. It has already cost \$18,000,000, when the original estimate was \$4,000,000. The penalties for breach of contract should be rigorously exacted where the offense is proved, before we have a carnival of robbery in which law-makers figure most conspicuously as law-breakers and the machinery of justice become a contemptuous farce. The committee of the Assembly who were charged with the subject made a report, in which they find that the experts were substantially right in their estimate of the profits on the job. The committee place them at about \$85,000.

The specifications for the armored coast defense vessel for which bids are to be opened March 15 have been completed in the Bureau of Construction and Steam Engineering in the Navy Department. The vessel is to be of 4000 tons displacement, 250 feet long, 59 feet beam, and 11 feet $7\frac{1}{4}$ inches deep from the top of the main deck beams to her inner bottom. She is to be armored with steel plates 16 inches in thickness, and is to be built throughout of materials of domestic manufacture. The total weight of her machinery, including boilers, engines and appurtenances, but exclusive of the turret machinery, is to be 431 tons. The engines are to develop and successfully maintain for four consecutive hours 5400 maximum indicated horse-power. For every horse-power over this the contractors are to receive \$100 in addition to the contract price, but if they fail to attain that horse-power they are to forfeit \$100 for each horse-power less than the contract calls for.

Sir Richard Cartwright's resolution before the Dominion Parliament designed to secure from the home government a recognition of the right of Canada to negotiate her own treaties was defeated by a vote of 66 against 94. In advocating the resolution he said: "If Canadian agents responsible to Parliament had visited Washington, various international questions would have been settled long ago. Canadian interests," he continued, "cannot be trusted in English ambassadors' hands."

The Lehigh Valley Railroad Company proposes to furnish Newark, N. J., with an abundant supply of pure water, 27,500,000 gallons daily, for \$4,000,000, and an additional supply of 25,000,000 gallons

daily for \$2,000,000 more, the entire plant and the lands overflowed to be the property of the city.

Edison will occupy 8000 feet of floor space at the Paris Exhibition with models of his inventions. Among other novelties will be a huge dynamo and an enormous lamp with 20,000 incandescent burners.

Two of the largest meat companies in the West, Armour & Co. and a new concern of which J. H. Flagler is president, threaten a lively competition in supplying the Eastern market. The last named is an organization of various cattle companies in New Mexico, Colorado and Mexico, including the famous ranches lately owned by Stephen Dorsey and Robert G. Ingersoll, and is said to have at present 20,000 head of cattle.

The initial meeting of the revived eight-hour movement was held at Cooper Union on Friday evening. Samuel Gompers, president of the Federation of Labor, was the principal speaker. S. E. Shevitch, the so-called socialist editor, said: "All the virgin forests of the world cannot produce enough clubs to club the movement down. There is not lead enough in the mines to make bullets to shoot it down."

England contemplates making a large addition to her naval armament. In France, 11 armored vessels are now in course of construction, five of which will be completed this year and the others in 1890 and 1891. Two steelclad cruisers are also to be completed within the same period. Eighteen cruisers of not less than 1000 tons displacement are on the stocks, and the programme for 1889-91 includes several torpedo cruisers. Furthermore, an expenditure has been authorized for the protection of the harbors of Cherbourg and Brest, and these works have already been begun. In Italy the programme of 1889-91 contemplates a gradual increase in every type or class of ship, from armored battle ships through protected cruisers, of which class this nation owns some splendid specimens, down to speedy torpedo craft and armed seagoing tugs. Russia stands third in importance, so far as relates to its naval strength, among the European powers. In addition to the existing fleet it was proposed to build 19 first-class battle ships, four second-class and ten first-class cruisers. The armorclads are now being turned out at the rate of three or four a year and the cruisers are being finished nearly as fast. Two battle ships are on the stocks and four more cruisers have been ordered in the Baltic.

Real estate sales in New York City indicate a remarkably active demand for this season of the year. Of the total for last week, amounting to \$4,750,000, property to the value of \$3,500,000 was sold at auction. A large store on Chambers street, that rents for \$19,800 per annum, sold for \$256,000 and as a rule the gross income from the prices paid is below 5 per cent.

The socialists who withdrew from the Central Labor Union a week ago met on Sunday and organized the "Central Labor Federation of New York." Ludwig Jablonsky presided and Ernest Bohm and Michael O'Brien were chosen secretaries. It was reported that 50 organizations had joined the federation, and it was decided to apply to the American Federation of Labor for a charter.

The greatness of the United States formed the theme of a thousand orations on Washington's Birthday. Among the most graceful tributes was the address of W. H. H. Murray, a venerable business man of Boston, who said: "When the Almighty fixed the geography of this continent He made this country possible. Egypt gave to the world records that the best scholarship of this day

is striving to decipher. Then Greece gave to the world letters and died. Then He called Rome into being, and she gave jurisprudence. He needed manners for the world and He summoned France, and France taught the world politeness. Then He needed constitutional liberty—liberty for life and property and home—and so England came into being. Then, my friends, I believe the march of events had moved forward to that point in the history of mankind that the hour had struck for human liberty to be born and crowned, and He called this country into existence [applause], and George Washington was the favored agent to assist in carrying out the Almighty's designs."

Muncie, Ind., is indebted to the discovery of natural gas for its existence, and this is true in the same sense that water has done much for navigation. Muncie has now 32 natural gas wells, capable of producing 1,000,000 cubic feet per day, equal in heating power to 5000 tons of coal. Estimating coal at \$2 per ton, the 32 wells will produce \$10,000 worth of the best kind of fuel every 24 hours, or over \$3,000,000 per year. The total number of factories of all kinds now located at Muncie is 52, and the total number of hands employed 2773. The Muncie Nail Works, employing 300 hands, are among the largest.

The Carnegie Free Library, in Braddock, Pa., just completed at a cost of near \$100,000, will be opened in a few days, not only to residents, but to all workmen in the Edgar Thomson Steel Works. The structure is of solid rough-faced stone from Ohio quarries, three stories high and of the Romanesque style of architecture, surrounded by beautiful walks and a roadway. The main entrance is surmounted by a heavy stone arch, above which the stonework is carried up to a Romanesque gable. On each side are the entrances to the store of the Carnegie Co-operative Association. The entrances are in the form of round bay-windows and run up into a tapering roof. In the gable of the center is a bust of Mr. Carnegie, and immediately under it is carved "Carnegie Library." Just under this and extending entirely across the front is a carved stone frieze 5 feet high. The roof is of iron throughout, also the rafters and beams. The beams and girders were all turned out by Carnegie's Homestead Mill and are very heavy structures, the beams all being 12-inch. The building probably contains 1000 tons of iron. The structure is 100 feet square. The side and rear walls are of fire-brick of great thickness. No wood was used except for finishings and floors. The library room is 86 feet long by 30 feet wide, and contains cases for over 5000 volumes.

The result of the extensive Japanese emigration to Hawaii has been to throw most of the Portuguese laborers out of employment, as they demand higher wages than the Japanese. About 2000 Portuguese are making arrangements to remove to the new State of Washington, if they can find suitable lands.

One of the largest gas wells in the country has been struck at Lancaster, Ohio.

Rumor says that it is the intention of the Manhattan Elevated Railroad Company to build a third track between the two tracks existing at present on the Sixth and the Third avenue lines. Express trains, it is said, are to be run to the Battery during the morning, and from the Battery during the rush of traffic in the afternoon. Inquiry resulted in obtaining no definite information.

The hull of the steamer Bristol, burnt at Newport, was bought by C. H. Gregory & Co., of New York, for \$13,450, and will be broken up.

MANUFACTURING.

Iron and Steel.

After being idle one week, the entire plant of the Keystone Iron Works, Limited, at Reading, Pa., resumed operations in full on Monday, the 18th inst.

The Bellaire Nail Works, of Bellaire, Ohio, have had under consideration for some time the subject of building an additional blast furnace, of the same size as their present one, but as yet have not arrived at a final conclusion in the matter.

The works of the Beaver Valley Mfg. Company, at West Bridgewater, Beaver County, Pa., which were totally destroyed by fire in August of last year, have been rebuilt, and have resumed operations. The new building is a frame one, 60 x 160 feet, with a wing 38 x 32. The company manufacture Bessemer steel castings by a new process, by which the metal is melted in a Swedish furnace, said to be the first and only one of the kind in the United States.

On Wednesday, the 20th inst., the Secretary of the Treasury awarded to the Pennsylvania Construction Company, of Pittsburgh, the contract for the iron roof and other parts of the new Government building at Denver, Col. The amount of the contract is \$29,700.

At a meeting of the Crane Iron Company, of Catasauqua, Pa., held on Wednesday, the 12th inst., Mr. Beauvean Borie, of Philadelphia, was elected a director, to fill the vacancy caused by the death of Mr. Fisher Hazard, of Mauch Chunk, Pa.

The trouble between Morehead, Bro. & Co., proprietors of the Vesuvius Iron and Nail Works, at Sharpsburg, Pa., near Pittsburgh, and the Philadelphia Natural Gas Company has been amicably arranged and the plant has resumed operations. The firm employs about 300 men.

No. 1 furnace of the Crane Iron Company, at Catasauqua, Pa., has been blown out for repairs and the workmen are rapidly removing the lining preparatory to the mason work. No 1 is the largest in the plant, and will be given a thorough overhauling.

Keystone Furnace of the Thomas Iron Company, at Chain Dam, Pa., has been blown out for repairs.

The name of the Canonsburg Iron Company, Limited, at Canonsburg, Pa., has been changed to the Canonsburg Iron and Steel Company. Three of the stockholders having refused to sign a paper closing up the affairs of the old concern, a committee of three stockholders has been appointed to ascertain measures for effecting that end. It is hinted that there may be some litigation before this is brought about.

The Duquesne Forge Company have been chartered, to succeed the Miller Forge Company, Limited, at Pittsburgh. The new concern has a capital stock of \$2500, divided into 100 shares of \$25 each. Additional particulars regarding this new firm were given in our issue of the 14th inst.

It is expected that the large new plate mill now in course of erection by the Manner Rolling Mill Company, of Toledo, Ohio, will be ready to commence operations about the middle of March.

From the Cleveland (Ohio) *Trade Review* of the 23d inst., we take the following: "The result of the recent arbitration between the Cleveland Rolling Mill Company and the employees in the rail and blooming mills is stated as follows: The company gave the men to understand that there were orders enough ahead to keep the mill busy for a year,

provided that the work could be turned out at a reduction; but if the men insisted on the old wages the mill would have to be closed for an indefinite period. The men met and decided to accept the decrease, which will probably average 15 per cent. or perhaps a trifle more all around. The decrease was graded from 28 to 5 per cent., as follows: To all men earning \$6 a day and upward, a decrease of 28 per cent.; those earning \$5 or more and less than \$6, a decrease of 20 per cent.; for \$4 and less than \$5, a decrease of 15 per cent.; for \$3 and less than \$4, a decrease of 10 per cent., and for \$2 a decrease of 5 per cent. Laborers who earn about \$1.15 per day were not reduced. This arrangement gave about 300 men employment, less than one-half the force employed when the mill is in full operation. The barb-wire mill, it is reported, will soon be in operation."

Mr. Theo. Morgan, for some years manager of the plant of the Sharon Iron Company at Sharon, Pa., has resigned his position to accept a similar post with the Portage Iron Company, Limited, at Duncansville, Pa. The change goes into effect on March 1 next.

The annual meeting of the stockholders of the Catasauqua Mfg. Company, of Catasauqua, Pa., was held at the office in that place on Wednesday, the 20th inst., and the old board of directors was re-elected, including James W. Fuller, of Catasauqua, who was recently chosen to fill the vacancy caused by the death of Fisher Hazard, of Mauch Chunk, Pa.

All the blast furnaces of the Pennsylvania Steel Company, at Steelton, Pa., with the exception of No. 2, are in blast and doing good work. This company had 3053 names on their pay-roll for January.

The order for the discharge of 150 men from the employ of the Glendon Iron Company, at Easton, Pa., has been modified, and it is now thought that not more than 100 men will be discharged.

The adjourned sale of the Middlesex Rolling Mill, at Middlesex, Pa., and adjacent property, will take place at the United States Marshal's office in Pittsburgh on Friday next, March 1.

At the organization of the board of directors of the Junction Iron Company, of Mingo Junction, Ohio, H. M. Priest was re-elected president and general manager, and George A. Dane, secretary and superintendent.

The Fort Payne Furnace Company, recently organized, propose to build a furnace at Fort Payne, Ala.

Anderson, Du Puy & Co., Pittsburgh, Pa., are much pushed in their department devoted to the manufacture of railroad spiral springs, and are at present completing an order for 300 tons of springs for the 2000 cars which the Pennsylvania road are building, probably one of the largest single contracts for springs given to one manufacturer. They are furnishing springs to railroads and agricultural machine makers in all parts of the country. Their success in this department has led them to consider the desirability of building a separate shop for elliptic springs for use on locomotives and passenger equipments, and they expect in the near future to have this department in good running order, and thus be in shape to handle a general line of all kinds and sizes of springs. They are also increasing their tool steel department, having their present furnaces taxed to their utmost capacity.

Machinery.

The Milton Mfg. Company, of Milton, Pa., are refitting their rolling mill at that place and putting in nut and washer machinery. Heretofore the firm have made

only bar and hoop iron. The company were organized in 1888, and now consist of S. J. Shimer, president; E. S. Shimer, secretary and treasurer, and G. S. Shimer, superintendent.

The Skinner Chuck Company, New Britain, Conn., have increased their capital stock from \$12,000 to \$36,000. The additional capital was called for by an increase in the business, which has been established less than two years.

The Aetna Mfg. Company, Warren, Ohio, recently received an order from Chicago parties for another of their large engines. It is for a 500 horse-power engine, with boilers and fixtures all complete, for the Chicago Steel Rivet Company, of Chicago, Ill. The engine is to drive a train of rolls in their new mills which they are now building at Hartford City, Ind.

The Phoenix Machine Company, of Cleveland, Ohio, manufacturers of steam cranes, have several large contracts on hand. They are building 18 cranes for the Anniston Pipe Company, at Anniston, Ala.; three large cranes for parties in Milwaukee; one for Charleston, S. C.; a large crane for a party at Chattanooga, and one for a Pittsburgh firm. They have orders enough on their books to keep them running over a year.

The Fuel Gas and Electrical Engineering Company, of Pittsburgh, have about decided to build a foundry and machine shop at Wilmerding, on the Pennsylvania Railroad. The Westinghouse Air-Brake Company have purchased a tract of land containing some 31 acres near that place for \$90,000, and there is some talk that all the Westinghouse enterprises will be moved to that place. The new air-brake building at Wilmerding will not be completed until the latter part of the summer.

Rankin & Fritch Foundry and Machine Company, St. Louis, Mo., have lately placed in position in their machine shop a planer to be used in the manufacture of plate glass machinery, which is one of their specialties and in which they have a large trade. The dimensions of the planer are 32 feet long by 8 feet wide, and by resetting can be made 24 feet wide, should the work so require. They are also laying the foundation for a boring mill, which will be one of the largest in that section, the weight amounting to something over 67 tons.

Hooker Colville Steam Pump Company, St. Louis, Mo., report an active demand in their line. Among the orders lately received was one from N. K. Fairbank, St. Louis, for a large size air pump to be used in their land factory.

St. Louis Drip Pan Company, St. Louis, Mo., have completed their works and placed in position the latest improved machinery for the manufacture of drip pans, and inform us they are now in a position to fill orders for any size that may be required.

Arthur O'Malley, whose address is in care of the Peck, Stow & Wilcox Company, of 27 Chambers street, New York, would like to correspond with New York manufacturers of petroleum burning engines.

The contract for furnishing machinery for the Mare Island Navy Yard has been awarded to the S. C. Forsaith Company, of Manchester, N. H., for \$5240.

Hardware.

With reference to an item which appeared in our last issue with regard to the recent fire in their No. 2 mill, the Washburn & Moen Mfg. Company, Worcester, Mass., advise us that only two upper floors were injured; that nearly all the machinery in the building was running again on Wednesday, the 20th inst., and that there has been, and will be, no delay whatever

in the execution of orders. A brick story has been added in place of the Mansard roof which was burned, and the building is now nearly roofed in.

Freeman Wire Company report an active demand for work in their specialty department. They have a force of men engaged in erecting the iron framing round the elevator hatches in the Odd Fellows Building, St. Louis, preparatory to constructing the channel and iron wirework inclosures for the elevators on Ninth street and Olive street sides of the building from second story to eighth story inclusive. They have completed the work of inclosing the elevator in the Hotel Belvedere, St. Louis, with expanded metal panel work, and have now under way several contracts for office railings, to be made of this class of work. The season is not far enough advanced to create much demand for fence work as yet, and the only order of importance under way is an elaborate channel iron and wire railing, made of long diamond wirework, with casting rosette center and cast-iron post in the panels, to inclose a cemetery lot for a wealthy gentleman in Arkansas.

At the annual meeting of the stockholders of the American Tack Company, of Fairhaven, Mass., held on Thursday, the 14th inst., the following officers were re-elected: Directors, O. P. Brightman, Loren Snow, J. A. Beauvais, E. W. Hervey, of New Bedford, and C. D. Hunt, of Fairhaven; clerk and treasurer, J. A. Beauvais.

A. M. Bristol, Rochester, N. Y., manufacturer of registers and ventilators, is making large additions to his plant, which when completed will about double its present capacity. He will also add a number of new sizes to his assortment in time for this season's trade.

The wood shop of the Cortland Door and Window Screen Company, Cortland, N. Y., was destroyed by fire the 18th inst., but their large storehouse, located some distance from the factory and containing goods manufactured by them for the last six months, remains intact and without injury. This will enable them to fill orders now on their books with considerable stock to spare, and as they rebuild at once and on a large scale they expect to fill all orders which may be sent them with their usual promptness. They advise us that their stock on hand consists of about 8000 dozen window screens and 30,000 doors. The new shops will consist of one building 200 x 60 feet, three stories high, and another 150 x 40 feet, one story high. They expect confidently to be in running order on or before April 1.

The Adams Coke-Bottom Mfg. Company, recently organized at Pittsburgh, are erecting a number of experimental ovens at Mansfield. The company, which has been organized with a capital of \$5000, has received its charter. The ovens are constructed with a false bottom that is worked by hydraulic pressure. They claim that it will be an immense saving in labor. At the present time one man is able to draw from three to four ovens per day. Their system will enable one man to draw 25 ovens per day. Another advantage is that the ovens are not dampened when the draw is made. A new bottom can immediately be put in, and four drawings can be made instead of three, as at present.

The Iron Land Company, of Minnesota, with £1,000,000 capital, has been launched in London. The company have purchased 2000 acres of the Vermillion range, which, it is estimated by the promoters, will yield 1,250,000 tons of ore annually at a profit of 2 shillings per ton.

The Iron Age

New York, Thursday, February 28, 1889.

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.
 CHAS. KIRCHHOFF, JR., - - EDITOR.
 GEO. W. COPE, - - - ASSOCIATE EDITOR, CHICAGO.
 RICHARD R. WILLIAMS, - - - HARDWARE EDITOR.
 JOHN S. KING, - - - BUSINESS MANAGER.

The Presidents' Agreement.

The questions regarding combinations in trade—trusts and the like—and also regarding the necessity or undesirability of legislation specially directed against them are important problems awaiting solution. What has now come up for general discussion was a few years ago confined to railroad matters. The supposed dangers of combinations among carriers led to the passage of the Interstate Commerce act, prohibiting pooling. We are now, however, called to look upon another side of the case—that there is an intimate connection between stable, open rates and public welfare, and that without association of some kind such rates are impossible. Hence it is that the mercantile community have in general supported the presidents' agreement heartily. At the same time, it is conceivable that there might be opposition to any legislation regarding trade combinations, and yet in favor of some restriction upon our railroads. This grows out of the essential physical conditions of a railroad, which forbid that it should ever be a free highway, or that the competition of capital with capital can there be relied upon to work always for the interest of the public at large, as is often claimed to be the case in business affairs. From these considerations it is unlikely that, as a matter of politics, the section forbidding railway pooling will be soon repealed. Our Western States would hardly favor such repeal.

In this view the agreement becomes an important step toward securing the good results of association. Its weakness is also its strength. By relying upon a certain measure of publicity, upon arbitration, upon public approval, rather than upon extreme penalties, the framers showed their wisdom. Too many railroad agreements have gone to pieces because they sought to accomplish too much, because their complete fulfillment demanded a practical surrender of each road's autonomy. It is to the credit of the presidents that they have provided for the non-observance of the tariffs when any company considered such action imperative for its own preservation. To this extent the agreement will be indorsed even by the anti-railroad sentiment of the Granger states. No road is bound to any theory of injustice, only that each one should do openly and for good reasons whatever it thinks best.

Directly in line with this phase of the situation is the statement of Judge Cooley and his associates that the law should be enforced. It is conceded by all that the sections about publicity of tariffs, against secret rate cutting and the like are excellent. Let them be put in practice and violations punished. Let the railroad managers be freed from that false notion that violations of the law of the land should not be pointed out and stopped by

the action of railroad men themselves. If a carrier has information that a competitor is violating his pledge and making underhand concessions, it is the poorest of all retorts to begin doing the same thing. Rather let the injured party bring the offender before the proper tribunal. The time is coming when the merchants in their own interest will demand adjustment of such troubles rather than hope for a further spread of the discrimination, in vain belief that they are its sole beneficiaries.

The railroad situation cannot be cleared up at once, and those investors who look for immediate return to old earnings will be disappointed. Extensions of lines into non-paying territory must continue for a year or two to be a drain upon the parent road. A railroad as well as a merchant may be brought near to bankruptcy through having valuable but unsaleable assets. Then, again, the channels of trade are constantly changing; a roundabout line built at high cost may, like the Missouri, Kansas and Texas, find itself out of the flow. It is a strong point in favor of the presidents' agreement that it does not pretend to regulate or decide everything of this kind, but contents itself with arranging for such a presentation of disputed points as will enable a fair decision from all concerned. It seems unlikely that the refusal of a few roads to join will be able to prevent the ultimate moral success of the plan.

The Nicaragua Canal.

The final passage, in its amended form, of the Nicaragua Canal bill by Congress and its signature by the President may be looked upon as foreshadowing an important era not only in American ocean trade, but also in that of the world at large. When, prior to the adoption of the Panama Canal route, M. de Lesseps and his engineers assembled at Paris, the choice to be made was between Panama on the one hand and either Nicaragua or the Atrato on the other. It was urged at the time by the American engineers that Nicaragua, judging from the surveys previously made by order of the United States Government, seemed by all means the most advisable route. It was urged, and is quite as much asserted now, that good terminal harbors are necessary adjuncts to any project, for vessels *en route* must have spacious roadsteads affording them protection while awaiting transit. As a rule isthmian routes possessing the best termini have the worst internal features; but the reverse seems to be the case with Nicaragua. The most eminent engineers in the world have studied and approved the plans proposed for the restoration of Greytown and Brito harbors. The advantages claimed for a canal at this point are: first, that it is in a favorable geographical position, being in a region of perpetual trade winds—which position, by the by, is also eminently favorable to the United States; second, that the canal can be constructed here at less cost than by any other route; third, that it passes through a country rich in resources and already sufficiently developed and populated to furnish subsistence to the construction force; fourth, that it presents no novel engineering problems, nor any that cannot be solved at a moderate expense; fifth, that it is a fresh-

water canal, and will perform an important function in scouring ships' bottoms and boilers; sixth, that it offers splendid facilities for dockage and repairs on Lake Nicaragua; seventh, that the material needed for the construction of the canal is close at hand; eighth, that all the plant can be conveyed by water communication already established, and by roads for which no royalty will be paid; ninth, that the mean average rainfall is comparatively small, and, tenth, that it possesses a superb inland sea, which drains 10,000 square miles of country, and thus gives a full volume for canal purposes.

Flushed as M. de Lesseps was with the success of the Suez Canal, and by reason of the latter predisposed in favor of a sea-level canal without locks, Panama was given the preference. The experience since made has amply proved that it was a fatal decision. It involved the ruin of the present shareholders' interest, and even in its modified shape of a canal with locks it is too expensive and too risky for any new company to finish, even if nothing were paid for all that has been so far accomplished and for the plant on the spot. In fact, the only thing that M. de Lesseps' company owns which is worth anything is the Panama Railway and the land so far granted by the Colombian Government.

The Nicaragua Canal will extend over a distance from ocean to ocean of 169 miles, of which 56½ miles are on Lake Nicaragua and 84½ miles on the rivers that are to be deepened and widened. The canal proper to be dug will not exceed 28 miles in length. There are to be six locks, three on the Atlantic side and three on the Pacific side, while for over a distance of 152 miles the maximum elevation above the level of the sea will be 111 feet. The present estimate of cost is \$65,000,000. The charter of the company nevertheless fixes the capital stock at \$100,000,000, to be doubled if need be, and the canal may be finished in 1895. Prior to signing the bill President Cleveland gave a hearing at the State Department to the friends and opponents of the measure, in order to determine whether there were any valid legal objections to the approval of the bill. Simon Sterne and John T. McCook, of New York, representing the American Atlantic and Pacific Transit Company, made arguments against the bill. The former contended that it was clearly unconstitutional, contrary to the spirit and traditions of the United States Government, and entirely unnecessary and vicious in that it recognized and encouraged one corporation to the detriment of others equally if not more deserving. Mr. McCook argued that to allow this bill to become a law would be an act of great injustice to Americans and Englishmen holding nearly \$2,000,000 of bonds of the Atlantic and Pacific Transit Company, and would undoubtedly lead to serious complications with Great Britain. Judge C. P. Daly, of New York, replied in behalf of the Nicaragua Maritime Canal Company, contending that the constitutional features of the measure were fully and freely discussed in Congress, and that no unlawful powers of concession were conferred by the bill. Subsequently the Clayton-Bulwer treaty was also gone over, and on February 18 Secretary of State Bayard and Attorney-General Garland made a report favoring the bill.

Since then Commander Taylor, general manager of the company, stated that they would organize and begin work promptly. The first work would be done at Greytown, and as soon as the entrance there was improved to 15 feet, which will probably take about two months, work is to start up all along the line. Last year Chief Engineer Menocal, Engineers H. C. Litchfield and Peary, together with M. Le Baron, made a thorough and careful survey of the entire route, and upon their report the company was formed. As the bill was at first opposed by strong influences in Congress, a preliminary charter was obtained from the Vermont Legislature, but the incorporation by our National Congress is a decided advantage gained, inasmuch as it lends the enterprise a specifically American character.

It may not be out of place to cite what the London *Times* of February 8 remarks on the subject:

It does not follow from the passing of the Nicaragua Canal bill that any vigorous steps will be immediately taken to carry the project into execution. Probably the immediate object is fully served by the passing of the bill. The progress of the Panama Canal is effectually arrested, and something may depend upon the measures that may be taken when that fact has been fairly brought home to the French investors. Negotiations may be attempted with a view of getting the works taken over at the price by an American company, and their success will depend upon the opinion entertained in America as to the feasibility of the route. One thing is certain, that the Panama company will negotiate under serious disadvantages. Every week that passes will depreciate the value of the plant and of the partially executed excavations, while the Americans will have plenty of leisure. When one party is anxious to sell and the other in no great hurry to buy, the price is likely to be moderate. It is quite possible, however, that the Americans may prefer to work the Nicaragua route, in which case the whole of the Panama company's expenditure seems likely to be lost. All that is quite clear at present is that the United States mean to be masters on the traffic route between the two oceans.

It has been asserted in Congress during the debates that if Americans were offered to-day all that has been done on the Isthmus of Panama in the canal enterprise for nothing, provided they would undertake to finish it, it would still be both cheaper and safer to leave Panama severely alone, and confine the undertaking to Nicaragua instead. We candidly confess that we unreservedly concur with this view.

In a letter to the Senate Finance Committee, under date of December 11, 1888, Fred J. Slade, of the New Jersey Steel and Iron Company, states that after an examination of the books of the company he finds that the cost of the most expensive size of beams and channels made at the works is \$35.90, and for the cheapest \$58.34, per ton of 2240 pounds, charging no interest on the plant. At that time the selling price was \$73.92, which usually includes delivery. The company have therefore made on these shapes a profit of from \$8 to \$15 per ton—say an average of \$12. The average yearly product of each mill is less than 9000 tons, making a profit of some \$100,000 per year on an investment of over \$1,000,000. Since the date of Mr. Slade's letter the price has been reduced to \$62.72, so that now the returns on capital are decidedly modest. These figures are worth

pondering over by those who have raised such an outcry against the beam combination, and should put a stop to the wild assertions of those who undertake, with the Hon. W. L. Scott, to figure out that the cost of beams and channels may be readily calculated from alleged cost figures of steel rails.

The Drawback System.

We print elsewhere a letter from one of the leading manufacturers of lead pipe and sheet lead in the country, in which some data are given clearly demonstrating the injustice of the retention of 10 per cent. of the duties on raw materials used to manufacture goods for export. The Treasury, which does not need the money, retains amounts considerably in excess of the cost of collection and supervision. The whole drawback system needs readjustment in accordance with simple principles. If an American manufacturer can secure foreign raw material, convert it into finished product in this country, and sell it in the markets of the world in competition with foreign rivals, he certainly deserves encouragement. He is adding to the amount of work being done here. He pays for wages, rents, fuel and supplies for which there would not be a demand but for his enterprise. His profits, however large or small they may be, remain in this country. He adds to the volume of business done, and aids in securing whatever advantages there may be in educating foreign buyers to look to us for their purchases. As matters stand now all these advantages are deliberately sacrificed. There are few articles in which American manufacturers are so far in advance of their foreign rivals that the economy of improved methods overbalances the additions to cost through extra handling, through higher wages, costlier fuel and supplies, and the necessity of earning on an average a higher rate of interest on his capital. To this would have to be added the cost of supervision by the Government of the entry of foreign material and the export of goods manufactured therefrom. It is conceded that such supervision should be thorough and close. It is only fair that the industry causing the expenditure on the part of the Government should bear the cost thereof. But it is undesirable and unnecessary that the Government should make a large profit on the transaction.

Under the circumstances, with the high retentions, the amount of business done is very small indeed. Nearly all there is of it is confined to the manufacture of packages for American products sold for export. It so happens that the Standard Oil Company is the chief beneficiary of the system, and that fact alone has been enough to create a prejudice against it which demagogues have been eager to foster. It is argued that by saving the amount of money returned by the Government that monopoly is adding to its already exorbitant profits. We are inclined to look at the matter in a different light. Anything which will cheapen the cost to foreign consumers without prejudice to American interests is so much gained in the direction of fostering consumption and extending trade.

Another argument, sectional in its character, is advanced against a more liberal

and a juster drawback system. Let it be assumed that works at tidewater succeed in building up a large foreign trade, based on imported raw material. This will enable them to give full employment to their plants, even in dull times. Other things being equal, they have the advantage, as against their rivals in the interior, of lower general cost, which is the result of full order books. They may even be content to sacrifice a part or the whole of their profits on work for foreign markets in order to compete more effectually with domestic rivals. In other words, a lowering of the retention to figures covering only cost of supervision to the Government would be equivalent to a discrimination against inland manufacturers.

It is possible that this contention may be just in some cases, but we are inclined to believe that the benefits to be derived from a modification of the present law would far outbalance any probable local injury. Incidentally it may be noted that it would silence the cry for free raw materials on the part of those who honestly believe that they can compete in the markets of the world.

The Westward Course of Empire.

The past week has been signalized by an event without precedent in the history of the United States, denoting "the march of empire." Using as an implement a quill plucked from a Dakota eagle, President Cleveland affixed his signature to a bill admitting four States of an enormous superficial area and of unbounded resources into the American Federal Union. The importance of the act cannot easily be exaggerated. Referring to the accretion of new States, the London *Times* says it is inevitable that "the center of national gravity must be substantially altered," and that "the Americans themselves imperfectly comprehend the actual amount of metamorphosis involved," doubtless meaning that the ascendancy acquired by the original 13 States and by other States which from time to time have dropped into the federal galaxy must gradually depart, and other millions of populations beyond the Mississippi River and spreading far out over the Western plains and beyond the mountains must have a controlling voice in the national councils.

Some of the best known Senators express themselves in unequivocal terms. Senator Cullom, of Illinois, says: "The admission of four States into this Union is a great event. It has occurred that two States have been taken in at one time, but it has never before occurred in the history of this country that the Congress of the United States has provided for the admission of four great commonwealths into the Union at once. These Territories are possessed of all the elements that justify their admission into the Union in population, resources, civilization, and all that makes them worthy of Statehood."

Senator Platt, of Connecticut, says: "The admission of four new States at practically the same time is an event the importance of which can scarcely be estimated. Probably a million of people are now permitted to assume the responsibilities and enjoy the privileges of complete self-government; and when we consider the abundant natural resources of the Ter-

ritories thus to become States, it is not too much to expect that within ten years 5,000,000 people will find homes within their borders and employment in every branch of industry and enterprise known to our civilization, limited only by climatic conditions. They are to be States of great development and will add immensely to our national power and opportunity."

Senator Hiscock, of New York: "I hardly know what more to say than that the admission, or rather the enabling act, was just and proper. They too long have been kept out for partisan or party purposes."

Senator Butler, of South Carolina: "My opinion is, each of the States admitted was entitled to become a State because they all have the necessary qualifications for Statehood—population, resources, institutions, and a soil capable of sustaining increasing numbers of people. Beyond this I do not think Congress ought to look in determining the question of admitting States."

Senator Morgan, of Alabama: "These four States were admitted because they possessed every qualification for Statehood. They will be growing, progressive States—not rotten boroughs like Nevada, which is losing its population every year. I think all four of the new States have wonderful resources, and have a good future before them."

Akin to this subject is the passage of a bill in Congress providing for the opening of a new ocean highway between the Atlantic and Pacific oceans, thus making another large stride in the progress of our country, her trade and destiny.

At the Edison Phonograph Works an extremely simple method is in use for keeping track of the work in hand and the work finished. It is possible at a glance to ascertain the number of each piece of work under way, and also the number of completed pieces. At the engine, which is located about at the middle of the shop, is placed a board about 3 feet wide by 7 or 8 feet long. The board is pierced with vertical and horizontal rows of holes arranged, vertically, in sets of five rows. Between certain rows are left blank spaces, upon which the names of the parts of the machine are written. Reports are daily made by messenger to the man in charge of the board of the new parts being worked and of those which have been finished. If five pieces have just been begun he inserts five pegs in the holes in line with the name of that particular piece. When these five pieces have been finished the five pegs are inserted in holes in red. It is evident that a simple inspection of this board at any time will show all the work of the shop on hand, and will also show the number of completed parts ready for assembling. An important advantage of this method arises from the fact that any tendency of one part to overrun the requirements is instantly perceived, and other work is allotted to the machine making that part. Should an order be received requiring quick response, the board would show how many machines were ready for assembling and how many and what parts were needed to meet the requirements.

In the Kingston Daily Whig J. Bawden makes a plea for the development of the water-power of the Mississippi River, along the road of the Kingston and Pembroke Railroad.

Pig Iron Warrants.

MR. HULL REPLIES.

To the Editor:—I have read with interest the criticisms on the warrant company published in your issue of February 14, and will avail myself of your invitation to reply to same. I note with pleasure that the favorable criticisms come from parties who evidently understand the plan and purposes of the warrant company, whereas, most of the unfavorable criticisms contain clauses that show conclusively that the warrant company's plans and objects are largely, or entirely, misunderstood by the writers. From experience I am satisfied that those who now oppose it will be heartily in favor of it as soon as they understand it thoroughly, unless we except the British ironmaster, who is the only natural enemy of the American Warrant Company.

I will not occupy unnecessary space by restating the objections as published in your issue of the 14th, but will simply answer them in the order they are noted in a memorandum before me. The warrant company is not a trust or combination, and has no powers or features that can be objected to by the furnace interest or by the country at large. It was organized for no purpose that is not plainly stated by its organizers. It has no power to coerce any party into business relations with it, or to interfere with any one who may choose to stay out. It simply offers to issue its warrants for the iron put into its yards by any furnace that makes a contract with it, and the best possible guarantee the furnaces can have that the warrant company will be managed for the furnace interests is that they are not bound to do any business with it during the whole term of the contract unless it is so managed and they choose so to do.

Its capital is pledged for one thing only—namely, as a guarantee for the safe custody of the iron put into its hands. The warrant company takes no commercial risk; it does not buy or sell its own warrants; it issues them to the order of the furnaces who store the iron, has no power over them after they are issued, and has no power to control, or attempt to control, the market. It is only on such a basis that this company could hope to issue a warrant that would command the confidence of the banks and moneyed institutions, and influence the millions of money that will flow to the absorption of its warrants. The company does not loan money, as one writer supposes, but it will act as broker to secure loans for furnaces who furnish warrants as collateral, and expects to be able to place these loans promptly, for any amount desired, whenever money is to be had on anything. Enough money has already been voluntarily offered by the banks, trust companies and capitalists to absorb all the iron that can be stored with us for many months, and it is expected that the standing of the warrant issued by this company will be unquestioned, and that it will eventually command money from the moneyed centers at as low rates as any other security, not excepting the Government bond.

In one sense, the warrant company may be designated as a clearing house, by means of which the furnaces may carry or market their surplus product when the consumer does not require it, and through which they may equalize, regulate or correct the various inequalities and abuses that now exist in the iron business. Through the warrant company it is expected to bring about not only uniformity in the weight of a ton and uniformity in classification, but such other improvements and such economy as may from time to time present themselves.

Under the present system of selling iron the producer is at the mercy of the railroads, who refuse to hold themselves responsible for the loss in weight, simply because they have not been required to do so, nor has the question been put in a shape that makes the demand seem reasonable to them. They, however, hold themselves responsible for shortage in grain, which is also determined by weight, simply because the elevator company becomes a medium that can reasonably require it. The warrant company will become such a medium for the iron interest, and the railroad companies will at once recognize that the warrant company cannot reasonably be expected to give a receipt and not require one in return. The furnace company will receive pay for their iron when they part with their warrant, and any claim for shortage made at the point of destination must be proved and made against the railroad company. All iron handled by the warrant company will be weighed on two different scales to insure accuracy, and will be classified under the inspection of expert graders.

The warrant company asks the furnace companies to make their contracts for twenty years, as it is only on the basis of one powerful, substantial and permanent company that the furnaces can hope to realize the full benefit that should be derived from such an organization. If there were two or more warrant companies in this country, they could not possibly command the support and confidence of the banks to the extent that one company would. We have found no one to object to the 20-year clause after they have understood the scope and objects of the company, but, on the other hand, several of the furnaces that have made contracts with us have insisted that we should on no account make contracts for less time, as the furnaces, more than any one else, were interested in insuring one powerful company. If the furnaces bound themselves by the contract to yard a certain amount of iron each year, there would be some reason to object to the 20-year clause, but they are free to handle their own iron across their own yard, and ship direct to consumers, as before, with all or any part of their product, and they will naturally only use the warrant yard to the extent that it is to their interest to do so.

An objection made to the warrant company is that "it will aid the poor furnaces;" that the rich furnaces do not need it, and that it is against their interest, as they claim it will simply keep alive the poor furnaces, whereas, in their judgment, the best results would ensue from their being driven to the wall and broken up, and thus be gotten out of the way. This is a short-sighted objection. The poor furnaces will not be got rid of in this way. There are more poor furnaces to-day than there were 10, 20 or 30 years ago. It is the present system of the iron business that creates these poor furnaces, and new ones will spring into existence to take the place of those that fail just as long as the present system is in effect. It is during a season of unnaturally high prices that furnaces are built in unnatural locations, simply because they can make money, even in such locations, while high prices prevail, and it is this class of furnaces that do the most injury to the iron business. They are the first to get hopelessly in debt; are at all times confident of a speedy reaction, and are responsible for the unnaturally low prices finally reached. Some system that will control the violent fluctuations will stop the building of this class of furnaces in the future. Those that now exist where iron cannot be made profitably at reasonable figures must, of course, succumb permanently, as under the warrant system there will be in the future no unnaturally high prices to revive or duplicate them.

It is claimed by many that even under our present system extremely high prices would never again be seen in this country. This is the same old story; it is repeated over and over again during each period of depression, and what is still more remarkable, is almost universally believed. But nothing is truer than that history repeats itself. We will be in a more dangerous situation on the next revival of business than ever before, as we will not again have a larger producing country than our own to draw from, as the American product of iron and steel now exceeds the product of Great Britain. If it were practicable for the rich companies to combine and raise several millions of dollars to be used to carry the product of poor but well-located furnaces over dull times, it would be a wise move and they might possibly thereby prevent the unnaturally low prices, but such a plan is not practicable. The warrant company, however, under a plan that is practicable, will not only accomplish this result, but will transfer the carriage of iron from the shoulders of the furnaces to the capitalist.

The condition of things now that will prevent the extreme prices is the carriage of large stocks. The carriage of large stocks is not possible if we rely simply upon the furnaces storing and borrowing money upon their product. Such a system is ruinous, whereas, on the other hand, the investing element of the country has shown itself ready and willing to carry almost any amount of securities that are made safe. The producers of oil, grain and many other commodities have taken advantage of this condition of things and use it for their benefit. Why should not the furnaces do likewise? Pig iron warrants, as soon as understood, will be a favorite security for investors, as iron can be carried cheaper than any other commodity, and is attended with less risk.

It is believed that as soon as the sale of iron by warrants becomes general the demand for them from investors will be great, and a warrant will be worth more than iron, as is generally the case in Great Britain. This company does not advocate or pretend to justify speculation, but simply looks at the business situation as it exists, and proposes that the iron trade shall have the advantages of this condition of affairs as well as other branches of business.

The great variety in quality of irons made by different furnaces, the great variety of classification and the great number of grades produced at each furnace are difficulties to be overcome, but are not obstacles to pig iron being put on the metal exchanges, as is claimed by some. There was just as great a variety in the classification of flour and wheat from different mills and different sections, and yet these differences have either been regulated or provided for, and the same may be done with iron. There are numerous instances in this country where irons now known by 40 or 50 different names may be grouped under one head and known by one name, as, for instance, "Lake Superior charcoal," or "Southern coke," just as the word "Glen-garnock" is one name applied to the product of many furnaces abroad.

Iron, like grain, would probably be put on the boards of trade in two separate departments—an option department and a cash department. In the option department, which would probably comprise 99 out of every 100 sales made, the difference on sales would be settled on the difference between price on the date of sale and the date of delivery for the grade which the metal exchange had made its standard to govern such sales; this would probably be No. 2 foundry, just as "No. 2 spring wheat" governs sales on wheat option boards. On this class of sales actual delivery of certificates is rarely made, a settlement simply being made on the difference

in quotations, as above. If deliveries were called for, they would be governed by the rules of the exchange as to what comprised good merchantable brands. In the cash department, however, actual certificates for the different grades pass, and in this department the mill man and foundry man or their agents will buy the actual brand or grade needed for consumption. The warrant will pass, for which payment will be made at the market price of that iron at the place of purchase, less the accrued storage charges and the official published rate of freight from the furnace to that place. In the option department it would not be necessary for the buyer or seller to know anything about quality, brands, grades, freights or location of furnaces. In the cash department, however, these features would probably enter into every sale made, and are fully understood by the parties who would deal in this department.

The introduction of the warrant system is not expected to make any difference in the territory which will consume the different brands of iron. The consumer will either buy direct, as he does now, or if he buys on exchanges will unquestionably buy warrants for the same brands and grades of iron that he is accustomed to use at the present time. The sale of iron on metal exchanges has been a failure heretofore, simply because of the absence of a warrant as a foundation for sales. Sales of grain and oil on boards were only made possible through the creation of certificates representing those commodities.

As to the "overproduction" objection, there is certainly something wrong in a system that makes a stock of three weeks' make "overproduction." This country has never produced in 10 years as much iron as it consumes in 10 years. What the American iron interest has suffered from is under-production and want of a warrant system. The farmer would certainly be considered very improvident if he was satisfied to raise during the growing months of the year only enough grain to satisfy the consumption of those months and relied upon importation to feed the country during the other eight months of the year. And yet this is exactly the principle on which the pig iron interest of this country has been working in the past, and must continue to work until we carry our iron, as well as our grain, by certificate or warrant. During every period of active business in the United States we import several millions of tons of iron and steel, which the British ironmaster has been long-headed enough to inaugurate a warrant system to carry, ready to take advantage of our improvidence. He is thus enabled to keep his furnace running during dull times, as well as during active times. There is no reason why the American ironmaster should not keep his furnace running instead, and pile up this surplus under an American warrant system, thereby supplying our own demand during active times, instead of importing large quantities from abroad, as heretofore, and permitting foreign interests to get the benefit of the high prices prevailing at such times.

Another writer claims that a large stock would be "a constant menace to the market." It is the carriage of iron by borrowers that is the "constant menace to the market." A large carriage by investors will not have this objection, and the danger from it will not exist as soon as it is known that iron can be marketed at any hour on the exchange. The government bond is not a "constant menace" to the market, simply because the demand for it is greater than the supply, and this will be the case with iron warrants.

The increase in the population of the United States is so rapid that our growth from 50,000,000 to 60,000,000 is hardly noticed, and the increase in business is so

much more rapid than the increase in population that it would be impossible, with all the available furnaces in the United States in full blast, for this country to accumulate more iron than she would consume in the first season of activity, or more than the investor will carry in the interim. (In considering this we have simply to remember the fact that when iron was \$60 per ton there were only a little over 60 per cent. of the furnaces on the official list in blast, and this is about the largest percentage that is ever likely to be in blast at one time.)

The wealth of this country has increased so enormously during the past few years that capital not only readily absorbs any security that is safe, but takes up many securities that have very little element of safety about them. There is no known security that is as absolutely safe as pig iron, and after warrants have once become known to the investor an enormous permanent carriage may be confidently relied upon, and the demand from investors will be as reliable as the demand from consumers.

The pig-iron manufacturer now has but one customer; that is the consumer. Under the warrant system the capitalist of the country would become a purchaser, and the facility thus created for placing the surplus would prevent prices ever going as low as they otherwise would. The fact that oil sold at 52 cents per barrel at the wells, on a stock of 500,000 barrels without certificate, and only went to 64 cents on a stock of 36,000,000 barrels with certificates, should be sufficient evidence of this.

Another writer urges as a reason against the success of the American warrant the fact that the Scotch warrant is for 500 tons, two-thirds No. 1 and one-third No. 3, and as mills do not use No. 1 iron and as founders do not use No. 3 iron, warrants would not suit either and users would not buy them. As the American warrant is for 100 tons of one grade only, and is entirely free from any such condition, this objection does not apply; on the contrary, the natural inference of an unprejudiced mind would be that if the British system has been a success under such drawbacks, how much more reason to expect success under the American system, which is entirely free from such objections.

Another party states that pig iron will not stand these charges, implying that the American warrant system adds to the expense of handling iron, whereas the reverse is the case. The warrant charge under the American system is 25 cents per ton. Nor is this 25 cents an expense. At present the producer must wait from 30 to 60 days after he has shipped his iron before he receives payment for the same. This loss of interest, the risk of the responsibility of the buyer during that time, and the possible loss from a claim of under-grade or under-weight on the part of the buyer, all of which, under the warrant system, the seller escapes, will more than save the 25 cents paid for the warrant. The warrant charge, therefore, is not an expense, as under the new system the warrant is paid for on its delivery. As soon as the sales by warrants become customary, the producer will make a clear saving in being able to sell his product at an expense of 5 cents per ton, in place of the present cost of from 35 to 50 cents per ton.

Another party objects to the plan because it would tend to make speculators of producers. This, again, is a mistake. Of course, producers can become speculators if they choose, but the practical result of the introduction of the warrant system is that the bulk of the stock is carried by the capitalist. In Great Britain there is no article that is as generally carried by all classes of investors as warrants. The warrant company was not organized

with special reference to furnishing aid to furnaces in any particular section, as some parties state. It was organized to furnish its facilities to every furnace in the country that chose to avail itself of those facilities. The subscription to the original stock of the company was nearly completed before it was known to any furnaceman, in any section, that such a company was contemplated.

The warrant company is not in any way connected with any other organization. Business men connected with other large organizations were invited to become stockholders, simply because the experience and ability of such men were considered advantageous to the warrant company—in fact, it was recognized that if the warrant company was to be a success it must be backed by men of broad business experience as well as by men controlling vast capital.

As another writer suggests, it is of course true that when warrants are placed on stock or metal exchanges they are liable to be manipulated by the bulls and bears. This being the case, it remains with the iron producers to consider whether such influence shall be used for or against their interests. The opinion of those who have thoroughly considered the matter is that it can do them no harm, but would present opportunities of great benefit to the iron interests. The extreme fluctuations possible to be caused by these influences would be quick and sharp, and confined to probably 20 days more or less; not long enough, during such advance, to encourage the building of furnaces in unnatural locations, nor long enough, during the decline, to compel furnaces selling on it. In fact, the furnaces would simply refrain from selling during the few days of low prices, and during the few days of high prices, if caused by a corner, could reap a rich harvest by simply rushing all their surplus iron into the warrant yard and unloading their warrant on the clique who were forcing the corner. Of course a furnace company having no warrant yard could not avail themselves of this opportunity, and the possibility of such opportunities occurring is a good reason for a furnace having a thoroughly equipped warrant yard at their plant, even though they might, in ordinary times, have no use for it. The furnace interest is the only interest that could create warrants, and, therefore, the interest that would derive most benefit from a corner, or sudden advance in price. The suggestion that bears might squeeze the market and hammer prices down to unnatural figures is not an objection. This is frequently done with stocks, because stocks which have no real value may at times stand at high figures, whereas iron has a positive value, which is known to thousands of mill and foundry men all over the country, who would be quick to take advantage of any unusually low prices that might be caused by manipulation.

Some contend that the warrant company would be of no use to the rich furnaces who do not borrow money. This, however, is not the general impression. In fact, the first two parties to sign contracts with the warrant company were concerns of large wealth who had never been known to borrow a dollar, and who probably have twenty times as much capital outside of their plants as they have in their plants; the majority of those who have signed contracts with the company are among the class who are abundantly able to take care of themselves.

The objections urged by iron commission men indicate that they have an idea that the success of the warrant company might cause them to lose their agencies. There is no foundation for this fear. There is no reason why furnacemen should not continue doing business with their present agents whether the sales are made by war-

rant or by handling the actual iron. The iron commission merchant would be benefited by the warrant system. The entire pig iron commission element of the United States does not now sell in one year as much iron as is produced in one year, whereas when the sale by warrant becomes thoroughly organized there will doubtless be sold in each year by warrants a hundred or a thousand times as much as is produced in each year.

The sales of oil on the New York Board alone are from 100 to 150 times as great as the entire production of the country, and the dealer in certificates nets his \$50,000 per year to-day with much greater ease than he netted his \$5000 when the actual oil was handled. In fact, in the case of pig iron the actual handling of iron must still continue, and the sale by certificates is simply an additional revenue thrown in the way of the dealers and agents, but the additional revenue derived, instead of coming out of the purchaser, comes out of the investor, and at the same time provides the investor with a less expensive commodity to handle than any he has at the present time.

All the objections urged in your issue of February 14 have been answered, directly or indirectly, in the above, except that some parties, although acknowledging that the warrant company would be of benefit to the furnace interest if it were a success, do not believe it possible to make a success of it. The best evidence of what can be done in the future is what has been done in the past. We can judge of the probable success of this plan, not only by what has been done in oil, grain and other commodities in this country, but by what has been done by the warrant system in Great Britain. If in Great Britain, where things are generally cheaper than in this country, between 1,000,000 and 2,000,000 tons can be accumulated on the warrant charge of 50 cents, it is fair to believe that a much larger amount can be accumulated here on a warrant charge of 25 cents.

Under the English system the furnaces must not only do the usual handling of the iron on their own yard, but it must be put on cars, shipped to the warrant company's yard, and there be rehandled by the latter. This extra handling does not add one farthing to the value of the iron, and is entirely avoided under the American system by establishing yards at the furnaces, where the iron can be moved directly from the pig bed and be piled at the warrant company's yard at the same expense that it is now piled in the furnace yards, and when shipped for consumption can be loaded on cars from the warrant company's yard at the same cost that it is now loaded on cars from the furnace yard, the iron being, in the meantime, in the possession and absolutely under the physical and legal control of the warrant company.

The storage of the iron covered by warrant commences from the first of the month following the date of the warrant, which gives the furnaces an average of 15 days to put their warrant on the market before any storage accrues. The investor, or carrier of the warrant, pays the storage, which is the same under the American as the British system, and no other commodity is carried at so small a cost. Although the carriage of iron by furnaces themselves is regarded as unprofitable and unwise, at the same time the carriage of that iron by some means is the great relief sought for, as it will bring about uniformity of price and make the iron business staple and uniformly profitable, if we judge by other interests that have been "liquefied" by the issuing of certificates to represent them.

Whatever doubts there may have been in the minds of the promoters of the warrant company as to its success during its

organization, there is in their minds no doubt of its success at the present time.

GEO. H. HULL,
President American Pig Iron Storage
Warrant Company.
New York, February 20, 1889.

CORRESPONDENCE.

Drawbacks on Exports.

To the Editor: Our attention has been called to the subject of the drawback on exports by your article in *The Iron Age* of February 21, and we beg leave to invite your consideration of the following in this regard. About a year ago we made some investigations, with the aid of the Department of Drawbacks of the New York Custom House, with the object of ascertaining what expense the Government is under by reason of the drawback system, and why it is thought necessary to retain 10 per cent. of the duty paid on the imported raw materials used when exported to foreign countries in the shape of manufactured goods. For the three years ending June 30, 1885, 1886 and 1887 respectively, the average amount of retention of drawback was in round figures \$220,000 at the New York Custom House. Besides this, fees are charged by the Custom House, viz.: Gaugers', inspectors', weighers' and entry fees, which amounted for the same three years to about \$80,000 a year. The total expense to the United States Government in this department for the same three years was not more than \$30,000 a year, so that there was a clear profit to the Government of say \$20,000 a year, without counting the 10 per cent. retention (1 per cent. in the case of sugar). That is to say, our liberal Government charges us \$300,000 a year for doing what costs it only \$60,000. There is another point to which we would call your attention. That is that at present foreign manufacturers can and do bring goods to this port and deposit them in warehouse without paying any duty, and then re-export them over freight lines from this port in competition with our own manufacturers, who are handicapped to the extent of the 10 per cent. of the duty on their raw material retained by our Government, with no ascertainable object whatever. It is difficult to see the reason for this extraordinary legislation. Congress has been asked to remedy this state of affairs by making the amount of the drawback equal to the duty imposed on the raw material again and again, and as there is absolutely no conflicting interest to contend against, it might be supposed that it would be easy to secure the passage of the proper measure. But the experience of the disinterested observer must convince him that the true interests of our people are not of the greatest importance to the "statesmen" who annually convene at Washington.

TATHAM & BROTHERS.

New York, February 25.

The Philadelphia Company, who have almost a monopoly of the natural-gas business at Pittsburgh, recently issued a circular to their patrons advising them to secure meters for the natural gas. After pointing out the many advantages to the consumer, as well as to the company, of burning gas by measurement, a very plain intimation is thrown out that it is probable in the near future the gas will be supplied in no other way. The conditions on which the changes will be made are that former contracts will be canceled as soon as the meters are set ready for use. For the present the charge will be 12½ cents per 1000 cubic feet, with a reduction of 20 per cent. for cash, or 10 after date of contract. For cash customers the rate will thus be 10 cents per 1000 cubic feet. The cost of setting meters and testing new connections will be \$5.

THE MINING ENGINEERS.

NEW YORK MEETING.

On Wednesday morning the members paid a visit to

THE SPIRAL WELD TUBE WORKS,

of which James C. Bayles is president. The plant is on a plot of ground of about 8 acres, with a frontage of 1172 feet on the Delaware, Lackawanna and Western Railroad, and embraces the spiral and cross welding machinery, a Manning boiler 85 feet high, an Ohio Buckeye 150-horsepower engine, a water-gas plant of special design, a machine and pattern shop, and apparatus finishing and testing pipe. The spiral-welding machinery consists of eight machines, making 4, 6, 8 and 10 inch pipe, to which machines are being added to make the range between 12 and 30 inch pipe. There are two cross-welding machines. The usual sizes of skelp are from No. 14 to No. 18 gauge, the machines being able to make pipe at the rate of about a foot per minute. The largest pipe yet made was 44½ feet, the usual maximum being about 30 feet for ordinary practical working. The pipe is tested by hydraulic pressure, one 10-inch No. 14 gauge pipe having resisted a pressure of 850 pounds per square inch.

The members then proceeded to the Edison Laboratory and the phonograph works at Llewellyn, N. J., where these famous establishments were inspected, and a trial run was made of the Edison magnetic ore separator. After an elaborate lunch, of which over 300 visitors partook, a session was held in the library of the Edison Laboratory, the proceedings being opened with a paper on "Magnetic Concentration," of which John Birkenbine and Thomas A. Edison were the joint authors. The growing interest in the United States in the utilization of the leaner magnetic iron ores was dwelt upon, followed by a review of the general principles underlying the construction of the different machines brought before the public recently. *The Iron Age* has placed before its readers illustrated descriptions of two of them, the Edison and the Wenstrom, the latter having been since then modified to some extent. A machine of the new design has just been completed at Bridgeport, Conn., and is to be shipped to Port Henry, N. Y. The third type, that of the belt machine, is represented by the Coakling machine, a description of which was published in *The Iron Age*. Another belt machine is the Norton, which is being developed at Troy. The Buchanan magnetic rolls have been tested over a long period by the Cheevers at the Theall Mine, near Brewsters, N. Y. Messrs. Birkenbine and Edison submitted some data on the results obtained by magnetic separation.

This paper was followed by that of Pedro G. Salom, of Philadelphia, of the Julian Storage Battery Company, on "Electric Storage Batteries."

The Evening Session

had been announced as one especially devoted to iron and steel, and brought the largest and most appreciative audience which the institute has had for a long time. It was opened by the reading of a communication from C. P. Sandberg, of London, England.

ON RAIL SECTIONS.

After reviewing his own work, well known in this country through his own writings and those of others, Mr. Sandberg indorses all that has been said about the evil produced by wide, thin flanges, which have gone to the extreme in America, and trusts that it will meet with a speedy correction on the part of engineers by the designing of sections that can be

made harder—as hard as the old sections in the beginning of steel-rail making—to enable makers to regain the "lost art" which engineers now lament.

With reference to the second cause of inferior rails—namely, want of inspection, he states that everything depends upon the kind of inspection. Sometimes specifications are overdone and impracticable. In general the guarantee is not found to be of much value, practically speaking. Buyers prefer to be convinced of having got their money's worth before they pay for the goods.

While Mr. Sandberg uses the bending-test with sample-ingots, as a preliminary, chiefly to enable the maker to avoid rolling brittle steel into rails, which might break under the falling-test, Mr. Hunt is satisfied with such a preliminary test alone, and does not enforce any falling-test at all. What is more, in his specification the bending tests are repeated two or three times, with a chance of ultimately getting one to stand, and having the rails consequently accepted. Mr. Hunt is not the only one abolishing the falling-test or drop-test. Mr. Sandberg has reduced the so-called "barbarous" tests so as to admit of greater hardness; but he sees no cause to abolish them altogether.

In reference to the cutting off of blooms 12 inches at the top end, Mr. Sandberg says: Fully appreciating the importance of sound ends, I think such a heavy cut must entail great loss upon the maker; and, worse still, that it will not absolutely secure the object in view, inasmuch as hollow sinkings will not always be detected thereby. I would rather aim to obtain in casting a more solid top to the ingot, through the quality of the steel. To promote this I would tolerate more silicon, which makes the steel in casting very quiet, and permits hardly any gases to escape. From thousands of analyses I have found that with 0.10 per cent. of silicon a more solid top is obtained, while no material effect is shown in the testing for physical qualities. I could cite several works on the Continent using regularly as much as ½ per cent. of silicon; their ingots are as if they were planed on the top, and need only the cutting off of a 12-inch crop end of the rail; neither ingots nor blooms being cut at all. In this theory I know that I stand alone, both in Europe and in America, and am, therefore, quite prepared to meet with objections. My difficulty in practice is to obtain the silicon in uniform proportion. While I sometimes get accidentally ½ per cent., at other times I get next to nothing and then I get the hollow top. Regularity in the pig iron, as to its contents of silicon as well as its heat, would rectify these irregularities in the finished article. This would be well worth the makers' attention as a means to insure both economy to themselves and sound rail ends, and satisfaction to the consumer.

The third cause of inferior rails nowadays, as compared with those first rolled, namely, the driving, is perhaps the most important of the three, particularly because there is no help for it. To ask the maker to give more time to both the chemical and the mechanical processes would be regarded as a suggestion to return to the old stage-coach. Nevertheless, the fact is that no sooner is the pig iron in the converter than it is out as a rail. Any one having the least experience in chemical processes must know that time cannot be dispensed with, but is necessary for dissolving, precipitating and mixing, and for the due escape of the gases produced. Why is the Siemens-Martin steel more homogeneous than the Bessemer? Simply because time is given.

Again, in mechanical respects, the old mills, running at slow speed, produced a close grain in the rails, because the pressure was given in the stage of brown heat.

This made the rails physically hard. It explains why different wearing results might be got from the same chemical composition. One rail might be rolled at red heat and the other at brown or nearly black. The thick flanges formerly prevalent permitted such cold-rolling without consequent rejections or waste. Since the thin flanges, like razors, have come into use, makers have been actually bound to spin them out in quick-rolling mills, and the only part that gets cold-rolling is the flange, while the head is always coming out red hot. No close grain or physical hardness can be expected in the big heads—which is just the reverse of what should be the result sought.

However, it is of no use to ask makers to roll slow; at least not until engineers will return to thick flanges of say ⅞ inch, or, rather, ¾ inch; and even then the ambition to turn out a rail a minute and so many tons out of a converter will not be given up. The only remedy hoped for is that, through the adoption of these thick flanges, the rail-steel might with safety be made harder chemically by admitting as much carbon (and silicon to give solidity) as the amount of phosphorus present will permit. It is in this view that Mr. Sandberg closes a paper recently read before the British Institution of Civil Engineers, with a suggestion of thick flanges and the use of steel base-plates, where the preservation of sleepers will necessitate a broader base than the rail-flange can practically give.

The second paper on the same subject was that of Frederic A. Delano, of Chicago, Ill., who is connected with the Chicago, Burlington and Quincy Railroad, from which we quote:

The designing of many rail sections by engineers who are far from being experts in the metallurgy of steel has led to the general acceptance of erroneous principles as the rules for such designs. Until very recently, it has been assumed that the more metal was put in the head to wear away the longer the rail would wear, and it has been the practice in adopting heavier sections to put all the additional weight on top of the rail-head of a very much lighter section. Careful investigation on a number of railroads has shown that of the rails weighing 65 pounds per yard and over the greater part have to be removed after comparatively trifling abrasion, solely because they are no longer fit for a smooth track. This is evidence of error in the principles of the design of the section.

It is generally admitted that, as a rule, rail sections designed since 1879 for rails of 65 pounds and over have not given entire satisfaction. There are several reasons which may account for this: first, a constant increase during this period of wheel-loads on engines and cars, together with generally higher speeds; secondly, new methods in manufacture, cheapening the cost of production and possibly producing an inferior article; thirdly, mechanical conditions in the rail itself due to the shape of the rail section.

1. The first cause is undoubtedly a real one. I think there is evidence that the elastic limit of much of the rail-steel now in use is actually often exceeded by the strains of practice, causing a flow of metal, which is then abraded by the wheel flanges; and the result is a kinking or a battering of the rail, which condemns it for a good track. Granting the existence of this cause, there are two ways of ameliorating the result; one is to increase the bearing surface of wheels on rails; the other, to raise the elastic limit of the metal, which subject I shall take up later on.

2. With regard to the second cause, it is held by many that the enormous production, low cost, and "improvements" induced by competition have involved

inferior quality of product. Many well-informed men are content to rest on the simple assertion that the old John Brown steel gave remarkable satisfaction, because it was made of a good iron and did not contain more than .08 per cent. of phosphorus, any analysis showing more being grossly inaccurate. If they are satisfied that this is the solution of the problem of making a really good rail, why do they not try their .08 per cent. of phosphorus? Low-phosphorus steel can be made to-day with more certainty and at less cost than ever before. The only question is whether the elimination of phosphorus is going to be worth what it costs. The fact that as many Bessemer charges are now blown in one hour as were formerly blown in a day is pointed at as evidence that the same care cannot be given to the operation; but I think men really conversant with the turning out of a large product will maintain that almost absolute regularity in the iron is necessary to keep things running with the clock-work regularity required for such a rate of production. Indeed, large product and general smoothness in mill-operation are, to my mind, an indication of a uniform product, so far as metal in the rail itself is concerned, and seem to me, therefore, not objectionable on that score. With the rapid rolling, however, particularly the rapid blooming or breaking-down of large ingots, I find fault.

3. That mechanical conditions in the rail itself, due to the general design of the rail section, can have any important effect on the service-value of rails has not been generally admitted, so I wish to lay particular stress upon this cause and attract to it the recognition it deserves. Speaking in general terms, that form of rail is, in my opinion, faulty, which has a deep massive head, a wide, thin base and a thin web, connected to the head and the base by small fillets only. The objection to this form and the advantages which might be obtained by different proportions may be concisely enumerated as follows:

a. Such a form necessitates rolling at a higher temperature, and, what is of chief importance, finishing at a higher temperature than permits the securing of a well-forged, compact rail.

b. This type of section probably encourages the use of a higher percentage of manganese to reduce the number of second-quality rails; and this production of second-quality rails, as well as the additional manganese, figure in the cost of the rails to the consumer.

c. Rails with heads out of proportion to the rest of the section require a great deal more of cold-straightening, because it is impossible to know how much bending or cambering such a rail needs in its hot state in order that it shall cool straight. This is certainly a very important consideration.

d. The same sort of disproportion must produce corresponding disproportions in the rate of cooling, causing internal strains, which are only partly dispersed or effaced by the small connecting fillets.

e. A section having these internal strains exaggerates the effect of any impurity which may chance to have segregated in the ingot, while a section not liable to these strains would safely admit of a generally higher carbon steel, as well as a considerable latitude in composition.

f. It is not economical to provide for an abrasion of some $\frac{1}{4}$ of an inch, or even more, from the top of the rail, if it is found that rails have failed long before this amount has been abraded. Instead of providing more height to wear away, we can do better by providing more breadth of bearing-surface, and metal of a higher resistance within the elastic limit.

g. Inasmuch as the funnel-shaped cavity, dispersed blowholes and possible impurities exist in the ingot in the axis of its length, it follows that these defects will

exist (especially in rails made from the upper part of the ingot) on an axial line which passes through the rail-section. It follows that if the rail-section has 50 to 55 per cent. of its metal in the head, the poorest metal is inclosed in the head, where it receives the least amount of forging; whereas, if the amount of metal in the head does not exceed 40 to 45 per cent., this poor metal occurs in the thoroughly-worked web portions.

The foregoing objections seem to be so formidable and convincing that I am glad to see a general tendency among all the later investigators to come to the same conclusions. It seemed to me that rail-sections should be made to certain definite proportions, regardless of the weight per pound. It is often said that the larger sections will admit the use of a higher carbon steel; but this assertion requires the proviso that the heavier section shall be similarly proportioned. One 74-pound section which I have in mind could not be safely made of as high a carbon steel as the 62-pound section from which it has been schemed.

The specifications which I append as a conclusion to these brief remarks may be of interest to some, as being different in several particulars from any other rail specifications. They were drawn up originally 15 months ago, and have not been changed in any important particular since that time.

Proposed Specifications for Steel Rails.

1. The steel used in the rails shall be made by the Bessemer or by the open-hearth process, and shall not contain more than 12-100 of 1 per cent. of phosphorus, as determined by an analysis made from a boring into the center of metal of the rail-section of any rail.

2. The ingots shall be poured with care, and the molds filled at one pouring, without undue spattering of the sides. No sand or water shall be thrown upon the ingots after pouring; but, on the contrary, coke or charcoal dust shall be used. In no case shall rails made from a chilled heat or a bled ingot be accepted as first-quality rails.

3. Cold molds or molds in such a shape as to require more than a hand-sledge to free them from the ingot shall not be used.

4. It is preferable that ingots, when taken from the pit, should be kept erect and so heated; but if this is not the practice of the rolling mill company the ingot shall not be laid on its side until it is certain that the central part has solidified.

5. Blooming rolls of 40 inches from center to center shall not be driven at a speed exceeding 30 revolutions per minute, and larger or smaller rolls shall not be driven at a speed exceeding this in linear velocity. (The linear velocity of an ingot going through the first or 18-inch pass of a pair of 40-inch rolls, driven at a speed of 30 revolutions per minute, would be about 205 feet per minute.)

6. No metal shall be cut from that end of the bloom which corresponds to the "butt" end of the ingot.

7. From that part of the bloom which corresponds to the top of the ingot an amount shall be cut equaling in pounds the area of the mean cross-section of the ingot in inches, or as much more as is necessary to secure a sound pipe, free bloom.

8. The number of the charge shall be stamped distinctly on each rail, and the place and date of manufacture rolled on.

9. The section of rail rolled shall conform to the template, and a variation of more than a scant 1-32 inch over or under the template height shall not be allowed, and the rail must be made close enough to template to fit properly in the splice.

10. The weight of the rails per yard shall be kept as close to the standard weight per yard as can be after complying with the conditions of Clause 9.

11. The rails shall be drilled for the bolts of the splice-bar, or, if necessary, notched in the flange, in accordance with the templates and diagrams furnished by the railroad company.

12. The rails shall be cut at right angles to their length, and be at 60° to 70° F., within $\frac{1}{4}$ inch of the standard length of 30 feet. No shorter length rails shall be accepted by the railroad company, except under special provisions of this contract for such acceptance.

13. Rails shall be perfectly straightened in both surface and line, and without any twists, waves or kinks. Particular attention shall be given to having the rails free from "camber," in which the ends droop, and also free from any flaws, cracks or excessive roughness.

14. The rails shall be finished at such a temperature that it will not be necessary to allow more than 4 inches for contraction on every 30-foot rail sawed immediately after coming from the finishing-pass in the rolls.

15. One rail-end, which must correspond to what has been the ingot top, shall be tested for each heat or charge by a drop-weight of 1 gross ton falling 10 feet on the rail-head, midway between the supports, 3 feet apart. (The bearings are to be of iron or steel, fastened firmly to oak framing constructed of oak timbers bolted together into a solid floor, and this supported on masonry foundations not less than 4 feet deep. The guides are to be smooth, straight and parallel.) Should one rail-end be broken by the above test, two similar rail-ends must succeed in enduring the shock, or else cause the rejection of all rails in that same heat. It is expressly desired that the rail steel shall contain as high a percentage of carbon as the maker is willing to put in and still produce a rail which shall endure this drop-test.

16. The representative of the railroad company shall at all times be allowed, on request, to see the *bona fide* analyses and carbon determinations, as made by the rolling-mill company, of the steel used in making these rails.

W. R. Hunt, of Chicago, followed with a paper on the same subject, prefacing it with a reply to the criticisms raised in Mr. Sandberg's communication. Mr. Hunt, starting from the conviction that high heat during the manufacture of the rail and a good product cannot go together, has reached the conclusion that the sections of the rail must be so designed that they can be made successfully at a lower temperature. The earlier rails, which gave such good results, were all of light sections, and they were almost all rolled at a lower heat. It was long supposed and it is still widely believed that chemically the metal in the older rails was superior to that now used. Mr. Hunt quoted a number of analyses of the famous John Brown rails, which showed an astonishing range of chemical composition, the only element present in relatively uniform quantities being manganese. The facts given prove that it was not the character of the metal itself, but the method of manufacture, rolling at a lower heat and with greater roll pressure. The metal was more thoroughly worked. Mr. Hunt, as the result of his wide experience in the manufacture of rails and his close study of the subject, submitted a series of designs of rail sections, the principal characteristics of which were a relatively shallow head and thicker web and flange. He submitted drawings of these designs, the character of which is indicated by the following distribution of metal in the head, web and flange for rails of different weights:

Distribution of Metal.

	Head.	Web.	Flange.
1.—60 pounds.....	41.67	21.11	37.22
2.—65 pounds.....	41.60	21.40	37.90
3.—70 pounds.....	41.62	20.55	37.83
5.—75 pounds.....	41.72	20.96	37.92
6.—80 pounds.....	41.95	21.21	38.34
7.—80 pounds.....	40.00	21.23	38.78
8.—85 pounds.....	43.43	21.20	38.88

No. 1 was specially designed with the idea of making it so that the rail will require the least amount of cold-straightening. No. 7 is a rail greater in height than usual. No. 8 is what Mr. Hunt would suggest as the future rail. Any of the sections can be rolled on existing mills without unduly heating the steel.

The discussion was opened by P. H. Dudley, who pointed out that the 80-pound section was quite similar to that designed by Mr. Dudley for the New York Central Railroad in 1883, a fact which Mr. Hunt admitted to be correct, and the omission of which was due to oversight. A running discussion took place between Mr. Hunt, John Fritz, of the Bethlehem Iron Company; E. C. Pechin, of Cleveland; Dr. Raymond, H. M. Howe, R. Chauvenet and others, chiefly on the question of the character of the pig iron. The majority of the speakers attempted to obtain a definite specification for the chemical composition of Bessemer pig capable of producing good rails, while Mr. Hunt confined himself to

the general reply that the iron is the better the purer it is, the nearer it comes to pure iron and carbon.

The Thursday morning session opened with the presentation by C. Kirchhoff, Jr., of three communications from members of the institute on the subject of

Oil as a Metallurgical Fuel,

the metallurgists reporting being G. H. Billings, of Boston; E. C. Potter, of the North Chicago Rolling Mill Company, and E. C. Felton, assistant superintendent of the Pennsylvania Steel Company, Steelton, Pa. The first named presented the following data as the result of his experience with

COAL VS. OIL IN PUDDLING.

Starting with everything cold, we used 3518 pounds of oil to get the furnace in condition to charge a heat. After charging we ran until we got out 13,840 pounds of puddled blooms, using 8437 pounds of oil. One gallon of oil weighs 6.328 pounds, and 8437 pounds of oil would equal 1333 gallons of oil, which, at 4½ cents per gallon, would cost \$65 (the expense of making 13,840 pounds of blooms). The expense for making one ton of blooms with oil would be \$10.909. As we make 5.70 tons in 24 hours, the expense for using oil as fuel for one day would be \$62.18.

Assuming that one ton of blooms can be puddled with 1.5 tons of coal, this at \$4.875 per ton, would cost \$7.31, and 5.7 tons, or a day's work, would cost \$41.68. As it costs \$62.18 per day using oil and \$41.68 per day using coal, we show a saving in favor of coal of \$20.50 per day. Having used 3518 pounds of oil to get the furnace hot and to make bottom, this is not included in the above calculation. Usually we only have to light the furnace, but in this instance the furnace had been repaired, and a new bottom had to be made, which required the quantity of oil necessary to make three heats of blooms, or 2109 pounds, which, deducted from the 3518 pounds, leaves 1409 pounds of oil. As this quantity must be expended every week in lighting up, it should be divided by 6 to apportion it to each day: 1409 pounds divided by 6 gives us 234 pounds of oil for each day, which, at 4½ cents per gallon, or .0075 per pound, would cost \$1.75 per day, and as we worked 1.2 days the cost would be \$2.10, which, added to \$62.18 (the cost of using oil for fuel for one day), gives us \$64.28, the actual cost per day for the use of oil for fuel. As it costs \$41.68 using coal as fuel and \$64.28 using oil as fuel, we show a saving in favor of coal of \$22.60 per day, and for 300 days, or one year, we would save \$6780 on this furnace. The customary amount of coal used for puddling iron is ton for ton, which would make the saving one-third greater, or \$9040 per year.

The cost of using oil for one week in a puddling furnace was found to be as follows: Starting with everything cold, we ran the furnace six days. We used 6602 gallons of oil and produced 65,595 pounds of blooms: 6602 gallons of oil at 4½ cents would cost \$321.83. As we have to pay \$24 for extra labor, this makes the total cost \$345.83, or \$11.81 per ton. Assuming that 1 ton of blooms can be puddled with 1.5 tons of coal (which, at \$4.875 per ton, would cost \$7.31), it would cost to puddle 65,595 pounds of blooms \$214.06, so that we show a saving of \$4.50 per ton, or \$131.77 per week, or \$6852.04 per year, by using coal instead of oil for fuel. Besides this, on a puddling furnace using coal we would have a boiler from which we would generate steam by the waste heat in value equal to, say, one-half of that which we can make by the direct use of coal, or 4200 pounds per turn, or for 11 turns, or a week's work, 46,200 pounds of coal, which, at .00217 per pound, would cost \$100.25 per week, which,

added to \$345.83, the cost for oil, gives us \$446.08, from which we subtract \$214.06, the cost of making same quantity of blooms by using coal. We get a saving of \$232.02 per week, or \$12,065.04 per year, by using coal instead of oil.

Coal vs. Oil in Raising Steam.—The following is the record of the first day, starting with everything cold. We used 2910 pounds of oil to evaporate 15,600 pounds of water. One gallon of oil weighs 6.328 pounds, and 2910 pounds of oil would equal 459.86 gallons, which, at 4½ cents, is \$22.42 (for 10 hours). As these boilers run night and day, 24 hours, at \$22.42 per shift, would cost \$52.81, and 300 days, or one year, would cost \$16,143 under one boiler. As we have three boilers, the expense of using oil would be \$48,429 per annum. Assuming 1 pound of coal would, under the same circumstances, evaporate 9 pounds of water, it would take, to evaporate 15,600 pounds of water, 1733.33 pounds of coal; this, at \$4.875 per ton, or .00217 per pound, would cost \$3.76 for 10 hours. For 24 hours, at .376 per hour, it would cost \$9.024, and for 300 days, or one year, it would cost \$2707.20, the expense for one boiler. For three boilers it would cost \$8121.60, thereby showing a saving of \$40,307.40 by using coal instead of oil.

On the second day, the furnace was hot (having run the previous day). The results were: We used 4156 pounds of oil to evaporate 27,600 pounds of water. One gallon of oil weighs 6.328 pounds, and 4.156 pounds of oil equal 656.76 gallons; at 4½ cents cost \$32.01, the amount used for 10 hours. As these boilers are run night and day, 24 hours, at \$3.201 per hour equals \$76.82 per day, or at 300 days per year the cost of using oil under one boiler would be \$23,046. As we have three boilers the expense of using oil would be \$69,138 per annum. Assuming 1 pound of coal would under the same conditions evaporate 9 pounds of water, it would take to evaporate 27,600 pounds, as many as 9 is contained in 27,600 pounds, or 3066.66 pounds of coal, costing \$4.875 per ton or \$.00217 per pound, by 3066.66 equals \$6.65 for 10 hours, or for 24 hours, at \$.665 per hour equals \$15.96 per day, or at 300 days per year the cost of using coal under one boiler would be \$4788; under three boilers the expense of using coal would be \$14,364, which subtracted from \$69,138, the cost of oil, leaves \$54,774. Therefore, we show a saving of \$54,774 per year by using coal instead of oil.

The second paper on the same subject presented was that of E. C. Potter:

CRUDE PETROLEUM AS FUEL FOR RAISING STEAM.

Fuel oil was first substituted for coal at the South Chicago works of the North Chicago Rolling Mill Company, in September, 1888, and was first applied to the battery of boilers in the converting department. This battery consists of 14 tubular boilers, 15 feet in length by 5 feet in diameter. To operate these boilers with coal, the following men were required for 24 hours: 14 stokers, 3 ash-wheelers, 6 men unloading coal, 2 water-tenders, making a total of 25 men. With fuel oil the following men are required to operate the same boilers: 2 water-tenders and 4 men to attend to the burners, making a total of 6 men. This gives a saving of 19 men by the use of fuel oil in place of coal, which at an average price of \$2 per day each would give a saving of \$38 per day. Comparing the consumption of fuel oil with that of coal, we find that for the week ending January 5, 1889, with an ingot output of 6403 tons, 2731 barrels of fuel oil were used, as against a necessary consumption of coal for the same work of 848 tons, showing 3.22 barrels of fuel oil to be equivalent to one ton of Indiana block coal. Figuring oil at 60 cents per barrel

and coal at \$2.15 per ton, we have the cost of oil, \$1.93, as equivalent to coal at \$2.15, making a net saving of 22 cents per ton.

In December, 1888, the rail-mill battery of 26 boilers, of the same dimensions as those in the converting department, was equipped for fuel oil. For the week ending January 5, 1889, with a rail output of 5208 tons, 5987 barrels of oil were consumed, as against a necessary consumption of coal to do the same work of 1805 tons, showing 3.31 barrels of fuel oil to be equivalent to 1 ton of Indiana block coal, which, with the costs named above, would show \$1.98 worth of fuel oil to be equal to \$2.15 worth of coal. The labor required to operate the rail-mill boilers for 24 hours is as follows with coal as fuel: 26 stokers, 4 water-tenders, 6 ash-wheelers, 12 men unloading coal, making a total of 48 men. With oil as fuel the following men operate the same battery for 24 hours: 4 water-tenders, 6 men to attend to the burners, making a total of 10 men, a saving over coal of 38 men in 24 hours, which, at an average price of \$2 per day, would be \$76 per day.

With the brief experience we have had with oil as fuel we find that the efficiency of the boilers is somewhat increased and the repairs materially lessened. The perfect cleanliness of the fuel and the ease and simplicity of supply and regulation, together with the steadiness and uniformity of steam supply, make it, for our business at least, a most desirable substitute for coal.

We have made no evaporation tests of any kind, the only test of its efficiency being the fact of its keeping our works running to their fullest capacity. This we find it will do, which cannot be said to be true of coal with our present boiler capacity.

The third series of data came from E. C. Felton, assistant superintendent, and dealt with the results obtained with

OIL AT THE PENNSYLVANIA STEEL COMPANY.

All oil used vaporized in the Archer producer, an apparatus for mixing oil and superheated steam, and heating the mixture to a high temperature, ½ to ¾ pound pea coal to gallon oil used to generate heat.

First Trial.—Heating hot ingots in two Siemens' heating furnaces in the blooming mill, six 14-inch ingots being a charge. The oil used was partially refined, paraffine and a part of the naphtha being removed. It was first put on in March, 1888. Six weeks' run, including the oil necessary to keep the furnaces hot over Sunday, showed a consumption of oil about 6½ gallons to 1 ton of blooms.

Second Trial.—Melting on 30-ton open-hearth furnaces, the materials being cold scrap and pig and iron ore. The same oil as above was used. The gas was carried 300 feet from the producer to the furnace. One month's run showed the use, including keeping the furnace hot over Sunday, of 48 gallons oil per ton of ingots.

Third Trial.—Six Siemens' heating furnaces in the blooming mill were fired with Lima oil. The gas was put on June 11, 1888, and has been used since constantly. The average for last six months, including Sundays and heating some cold ingots, was about 6 gallons oil per ton of blooms. This amount varies with product of mill. Under the most favorable conditions, hot ingots and all the stock which the furnaces can handle, the consumption of oil is 4½ to 5 gallons per ton of blooms. Cold ingots require about three hours in the furnace.

Fourth Trial.—A 30-ton open-hearth furnace was heated with Lima oil, the producer being near the furnace. Six weeks' run showed a consumption of 54 gallons of oil per ton of ingots, including Sundays and starting the furnace. The best week's record was 46.7 gallons. The loss proves

to be somewhat greater than with coal gas, and some trouble was experienced by the clogging of the checkers with fine particles of oxidized iron.

Fifth Trial.—Melting in a 5-ton open-hearth furnace since October last showed a consumption of 50 to 55 gallons of oil per ton of ingots.

Sixth Trial.—Raising steam under two return flue tubular 100 horse-power boilers. The best 12 hours' work showed 16 pounds of water evaporated by 1 pound of oil; the average was about 12 pounds water per pound oil, the temperature of the feed-water being about 160°. The use of oil is not so economical as pea coal.

Seventh Trial.—Oil is being used in a reverberatory furnace for heating cold blooms. The trial is now in progress and is not far enough advanced to report results.

During the discussion which followed R. W. Hunt, of Chicago, reported that when he was in charge of the Troy works an experiment was made with the Hayden apparatus for burning oil. One of two Swindell furnaces was fitted up with it, while a second furnace, identical in construction and in capacity, remained unaltered. Both were serving an 18-inch mill. The petroleum used cost 4½ cents at that time, while the Westmoreland coal cost \$4 per ton. Records kept over a period of three months, under practically identical conditions, showed that if oil could be had at 3 cents a gallon there would be a saving of 50 cents per ton.

J. M. Sherrerd, of the Troy Steel and Iron Company, referred briefly to the experiments now being made at that plant, conditions having considerably changed. The use of oil has been eminently successful in Troy in connection with its use to fire the boilers of the furnace plant when the gas supply happens to be inadequate. Under these conditions oil possesses the great advantage of responding quickly at a time when a prompt supply of steam is particularly needed. Mr. Sherrerd stated that the entire oil consumption for the blast furnace boilers was 1500 gallons in a month, in which time the furnace produced 5900 tons of pig iron.

Dr. R. W. Raymond called attention to an obstacle to the introduction of oil as a fuel, giving as an instance the experience with it at the works of Cooper & Hewitt, at Trenton, N. J. Oil was introduced in one of the puddling furnaces, the result being that heats could be got out faster. The puddlers were paid a lump sum for boiling, they paying helpers. Although the introduction of oil assured to them increased earnings, they declined to make a reduction in the price representing partially the saving of wages to laborers and helpers, on the ground that it would be depriving the latter of work.

The president, Professor Potter, stated that experiments at a large works in St. Louis had shown that oil at 3 cents, the price then ruling, is equivalent to \$2 coal. But as coal costs \$1.37½, delivered, oil is too dear to use. In some instances where cleanliness and a clear fire are particularly desirable oil is preferred. Thus the St. Louis Shovel Company have adopted it for their forges.

Prof. W. P. Blake, of New Haven, spoke on

THE COPPER DEPOSITS OF COPPER BASIN, 30 miles southwest of Prescott, Ariz. The copper occurs chiefly as malachite and azurite in sandstone belts, which overlie a granite formation. Erosion has removed parts of the sandstone deposit, leaving abrupt banks flanking both sides of the valley. The occurrence is very showy, the entire sandstone belt being a mass of green ore with streaks of blue azurite. The copper contents are not so high, however, as the appearance of the sandstone would seem to justify, since the

malachite and azurite generally are merely thin incrustations of the grains, pebbles and boulders of which the rock is composed. The percentage of copper ranges from 5 per cent. up to 20 per cent., the average being about 10 per cent. In the granite, through which course a number of dikes, are a large number of seams and veinlets, carrying red oxide in the center veneered with malachite. Besides, the granite contains, finely distributed through it, copper pyrites. Professor Blake traced in a very interesting manner the connection between the metalliferous contents of the granite and the ore in the sandstone, showing how strong is the evidence in favor of the theory that the origin of the latter is to be found in the older rock. Professor Blake touched also upon the question of the extraction of the metal from the ore. Its high silica contents, the absence of proper fluxing material and the high cost of fuel have led to the abandonment, at least temporarily, of the plan of smelting in the district, although a furnace is partially completed. Professor Blake suggests extraction by means of dilute sulphuric acid and precipitation electrolytically. The acid he proposes to manufacture from auriferous pyrites, the residues of which, after burning, are to be chlorinated for the extraction of gold.

Following Professor Blake, Henry J. Williams, of Pittsburgh, presented a paper on the "Determination of Silicon in Ferro-Silicons and a Study of Its Reactions with Alkaline Carbonates." During the brief discussion the principal subject became the graphitoid form of silicon, and the presence of 2 to 3 per cent. of silicon in the greater part of the aluminium of commerce.

The afternoon session was devoted exclusively to the report of the council and to the discussion of questions relating to the policy of the institute. The usual banquet took place at the Hotel Brunswick in the evening.

On Friday morning the members inspected the Stevens Institute of Technology, and held a meeting there, the first paper being a brief note from Prof. W. P. Blake on the storage of water in Arizona, dealing principally with the large dam at Walnut Grove, Yavapai County, Arizona. E. G. Spilsbury, of the Trenton Iron Company, Trenton, N. J., described and showed samples of the new locked-wire rope, an English invention which the company have begun to introduce. Oberlin Smith, of the Ferracute Machine Company, Bridgeton, N. J., showed samples of the tin nail made from scrap tin plate, to which we have already referred in the columns of *The Iron Age*. He traced the development by which the special machinery was brought to its present form, making from 80 to 90 nails a minute. F. A. McDowell gave an account of the work of uncovering the roof of the Tilly Foster mine, illustrating it with a very fine series of stereopticon views. Professor Denton, of the Stevens Institute, presented the last paper of the meeting, on the work of air compressors.

At the invitation of Professor Morton, president of the Stevens Institute, the members enjoyed the hospitality of his house, scattering afterward into small parties to visit different points of interest. Saturday was devoted to an excursion by river boat to the works of the Central Forge Company, at Whitestone, L. I., to the torpedo station at Willett's Point, and to Fort Hamilton, where Captain Zalinski explained the operation and fired the famous dynamite gun of which he is the inventor.

The Crane Iron Company, at Catsauqua, Pa., are experimenting with an ore concentrator invented by the superintendent of the company.

Washington News.

(From Our Regular Correspondent.)

WASHINGTON, D. C., February 26, 1889.

The attitude of Chairman Mills, of the Committee on Ways and Means, on the Cowles Tobacco-Tax Repeal bill, amended, reported from the Committee on Appropriations, practically puts an end to all prospects of revenue reduction by this Congress. Having been voted down by an overwhelming majority on his Senate substitute constitutional proposition he has announced his determination to prevent action on the internal revenue movement by means of filibustering. Speaker Carlisle has agreed to recognize Mr. Randall for the purpose of taking up the bill from his committee, but he says that he will also recognize Chairman Mills on his dilatory motions and will vote against the bill if it comes to a vote. There are fully 70 Democrats who are with Mr. Randall on the measure reported from his committee, and will follow his leadership if the opportunity be offered.

There has been considerable canvassing among the Democratic Representatives in hope of persuading Chairman Mills and his friends to abandon their determination to obstruct revenue legislation and to permit the tobacco-tax repeal to go through. Chairman Mills says that not to oppose the Cowles bill would be to surrender their whole position and abandon the doctrines of the St. Louis platform and the President's Message. He thinks that a contest is necessary in order to keep the party in line with the doctrines of a large majority of its own members. Should the Cowles bill get through the House it will be difficult to put it through the parliamentary routine of the Senate, as all the appropriation bills have not been disposed of.

In the House it is not Mr. Randall's purpose to call up his bill until the appropriation bills are finished. The larger share of the attention of the two Houses of Congress is so much absorbed and diverted by the approaching inauguration of the President-elect that it is difficult to press any measures except such as are indispensably necessary to the administration of the Government.

There has been considerable subsidence of extra session talk since the new States have been admitted. It will remain to be seen whether the reduction of the surplus revenues will be regarded by President Harrison as a sufficient reason for the calling of Congress into extra session.

OBITUARY.

COL. DAVID F. HOUSTON.

Col. David F. Houston, general manager of the Crozer Steel and Iron Company, at Roanoke, Va., and a member of the State Senate of Virginia, while on a visit to his cousin, Robert J. Houston, at Lancaster, Pa., on February 16, slipped and fell on the icy pavement, rupturing a blood vessel, and dying from hemorrhage in a few minutes. The deceased was a member of a prominent family of Eastern Pennsylvania. He achieved an honorable name as a soldier and as an intelligent and enterprising business man.

HENRY MC SHANE.

Henry McShane, senior partner of the house of William McShane & Co., manufacturers of plumbers', steam and gas fitters' supplies, and having headquarters in Baltimore, New York, Boston, Brooklyn and Washington, died suddenly at his residence, Mount Washington, on the 23d inst.

TRADE REPORT.

Philadelphia.

Office of The Iron Age, 220 South Fourth St. |
PHILADELPHIA, Pa., February 28, 1889.

Pig Iron.—The market does not show much buoyancy, but there are some indications of a reaction from the depression of the past two or three months. Holders have fixed their mind on prices which they appear to have determined shall be their minimum, and as consumers are confronted with absolute firmness, the conviction is gaining ground that as prices are not likely to be lower, there is no risk in placing orders at current rates. The tendency, therefore, is to select the best brands, so that in this direction, at all events, an early improvement is not improbable. There is plenty of Iron at from \$17 to \$18 delivered, for No. 1; \$16 @ \$17 for No. 2, and \$15.25 @ \$15.75 for Gray Forge. It is not every consumer that can afford to risk such qualities as may be available at the inside quotation, and by the same rule only standard and tried qualities command the outside figure. However, it is usually considered a good feature when prices can be quoted with confidence, and with the extreme variations limited to 50¢ or \$1 per ton, and this, we believe, may be done to-day, allowing a little more for premium on three or four brands, which are too well known to require specific mention. The feeling, therefore, may be regarded as very steady, and if similar reports come from the West, the trade are inclined to expect some good buying within the next couple of weeks. Things are not at a standstill by any means, but buying has been of that unsatisfactory character that it was impossible to form any definite idea as to its continuance. Orders were sent from time to time, according to immediate requirements, but nothing was taken for more than 30 days ahead. The consequence is that the majority of consumers have little or no Iron in their yards, so that they must buy if they intend to keep their hands employed. Should the outlook improve and prices show a firmer tendency, orders would double up at once. There is not much chance for materially higher figures, of course, but on a dull market buyers get various advantages which are not to be had when the turn is in the other direction. Hence, if buyers once get the idea that the market is on rock bottom, it is not much of a step to increasing activity, and from that to better prices. With so large a production, and with more or less uncertainty in regard to consumption, the disposition still is, in the majority of cases, to operate cautiously, although, as already stated, the conviction is becoming general that the lowest point of depression was passed two or three weeks ago, and the trade is disposed to regard the outlook as more encouraging than for some time past.

Foreign Iron.—There is nothing doing, although asking prices are firm as last week's quotations, viz.: Bessemer, \$19.50 @ \$20, c.i.f., duty paid. Spiegeleisen, \$28.25 @ \$28.50, c.i.f., duty paid, for 20%.

Blooms.—A good demand is reported at quotations as follows: \$28 @ \$28.50 at mill for Nail Slabs; \$29 @ \$30 for Sheet Iron Billets; \$30 @ \$31 for Soft Tank, and \$35 @ \$36 for Flange purposes; Charcoal Blooms, \$52 @ \$54; Run-out Anthracite, \$41 @ \$42.50; Scrap Blooms, \$32 @ \$33 per "Bloom" ton of 2464 lb.

Muck Bars.—The demand is slow and prices irregular and unsettled. Some parties are offering Bars at \$26.50 @ \$27, delivered, while others ask \$27 @ \$27.50,

but in ordinary cases \$27 is considered a full quotation, although a sale was made as high as \$28 a few days ago for a special quality.

Bar Iron.—The demand for Bars is very unsatisfactory; large orders being scarce leaves little beyond a small day-to-day trade, which is barely sufficient to keep the mills employed on single turn. There are no inquiries from large consumers, and for the present prospects are not encouraging, although it is thought that with the incoming month business will probably take a new start. Country mills are said to be doing fairly on local orders, but prices are so low that there is no margin for profit, and in many cases it is thought that actual cost is not realized. Skelp orders are scarce, too, so that manufacturers feel very much discouraged. Prices are irregular, and Bars are quoted all the way from 1.70¢ to 1.85¢, according to circumstances. Skelp is nominal at 1.75¢ for grooved and 1.85¢ @ 1.9¢ for sheared, but no recent transactions are reported.

Plate and Tank Material.—The feeling in this department is very despondent. There is a fair amount of business doing, but Steel is so largely called for and is quoted at such low prices by Western mills that local concerns have scarcely a chance when a large order is involved. It is said that both bridge and ship builders will be heavy buyers some time next month, but with such a scarcity of work it will require a great deal of business before prices show much improvement. Nominal quotations are as follows: 1.90¢ @ 2¢ for Ordinary Plates and Tank Plates, 2.1¢ @ 2.2¢ for Universal Plates; Shell, 2.4¢ @ 2.5¢; Flange, 3.5¢; Fire-Box, 4¢; Steel Plates, Tank and Ship Plate, 2.1¢ @ 2.25¢; Shell, 2.7¢; Flange, 3¢ @ 3½¢; Fire-Box, 3½¢ @ 4½¢. P. S.—An order for about 6000 tons is to be placed on the market in a day or two, chiefly for Plates and Angles, all Steel.

Structural Iron.—Orders for large lots are still in the future, and what little work is going on is chiefly on old contracts. Those directly engaged in this department say that a heavy demand may be regarded as certain, although it may be some time yet before it comes on the market. Financial arrangements have to be settled before anything can be done, but in the present easy condition of the money market there is not much doubt on this point, although there may be more or less delay in carrying them through. Meanwhile mills are only partly employed, and therefore quote low figures on anything that will tide them over until things improve. Quotations nominally as follows: Bridge Plate, 2¢ @ 2.1¢; Angles, 1.95¢ @ 2.5¢; Tees, 2.4¢ @ 2.6¢; Beams and Channels, 2.8¢ for Iron or Steel.

Sheet Iron.—The demand is as good as can be expected at this season, and as a rule mills are getting a fair amount of work. Specialties are in very good demand, and the general report is rather more favorable than in other departments. Prices are about as follows for the best makes:

Best Refined, Nos. 26, 27 and 28....3 @ 3½¢
Best Refined, Nos. 18 to 25....2½¢ @ 3¢
Common, ¼¢ less than the above.
Best Bloom Sheets, Nos. 26 to 28....4¼¢ @ 4½¢
Best Bloom Sheets, Nos. 22 to 25....3¾¢ @ 4¢
Best Bloom Sheets, Nos. 16 to 21....3½¢ @ 3¾¢
Blue Annealed.....2.6¢ @ 2.8¢
Best Bloom, Galvanized, discount.....62½¢
Common, discount.....67½¢

Steel Rails.—As regards this market there is very little to report. Small lots are being taken at quoted rates, but large orders are scarce. The feeling is hopeful, nevertheless, as manufacturers feel somewhat confident that the demand will ultimately develop into a good deal larger business than that of 1888. The demand for Steel

in other shapes also helps them out considerably, so that, while the immediate demand for Rails is poor, the chances appear to favor improvement. Prices are fairly steady at from \$27.50 to \$28, at mill, according to size of order, time for delivery, &c.

Oil Rails.—Nothing doing in spot lots, which are held at \$24 and upward, or at \$23.50 for shipments. Sales for delivery at interior points are being made at from \$24 to 24.75, with a fair inquiry at inside figure.

Scrap Iron.—There is a little more demand, and prices are steady at about the following quotations: \$20 @ \$20.50 for cargo lots; \$21 @ \$21.50 for carload lots, delivered, or for choice \$22; No. 2 do., \$14 @ \$15; Turnings, \$18 @ \$14; Old Steel Rails, \$20 @ \$21; Cast Scrap, \$15 @ \$16; do. Boring, \$9 @ \$10; Old Fish Plates, \$23 @ \$24; Old Car-Wheels, \$17 @ \$18, Philadelphia.

Wrought-Iron Pipe.—There is not much doing for immediate delivery and prices for such are unsettled, and for desirable orders somewhat easier. The demand for large Pipe promises to be very large during the spring months, but financial arrangements are not far enough advanced to permit of the orders being definitely placed on the market. For the ordinary run of business nominal discounts are about as follows: Butt-Welded Black, 55 %; Lap-Welded Black, 65 %; Butt-Welded Galvanized, 45 %; Lap-Welded Galvanized, 55 %; Boiler Tubes, 62½ %.

Nails.—Business is unusually quiet, and very little interest is manifested in it, beyond each mill retaining its own line of trade. Store lots are quoted \$1.90 @ \$2, and while there are plenty of cheaper Nails in carload lots very few seem to be wanted. The feeling among manufacturers is a little better, and efforts will be made to maintain remunerative prices when the spring trade opens.

Cleveland.

CLEVELAND, February 25, 1889.

Iron Ore.—Inquiries from consumers are now coming in quite freely, and offers are known to have been made for Ore in large quantities. Until, however, the mining companies establish formal quotations no active buying movement is looked for. Neither the mine owners or the furnacemen can explain the delay in opening the market. Prices have been practically determined, and many buyers are of the opinion that the total output of the mines will be taken. These conditions would seem to warrant an immediate beginning of business, but the only activity now discernible is confined to the exchange of letters, in which the amount of Ore likely to be consumed is more frequently discussed than the question of prices. Apprehensions regarding Bessemer Ores have been in some degree removed by continued favorable reports from the Rail manufacturers. Eastern furnacemen have been offered Ore within the past week on favorable terms, and it is quite probable that the first heavy sales will be in that direction. Vesselmen are still quite confident of being able to maintain last season's schedule of lake freights, but everything indicates the contrary. It has been announced during the past week that the \$1.25 charters from Ashland to Cleveland cover 125,000 tons of Ore. The permanent rate from the head of Lake Superior to Cleveland will likely be \$1.40, a rate that not only means fair profits to the mine owners, but permits the vesselmen to earn fair dividends upon their investments. All of the mining companies are waiting for the Republic, Champion, Cleveland and Chapin mines to fix prices, after which business will go forward with a rush. A

half dozen small lots of Ore on the docks have been sold during the week at \$4.20 for non-Bessemer Hematites, and \$4.15 @ \$4.20 for non-Bessemer Menominee. About 27,000 tons of Ore have been shipped to the furnaces since the last report.

Pig Iron.—The market retains the encouraging features noted last week. Evidence is not lacking that Standard Irons, having reached bottom figures, are again advancing both in demand and price. More Iron was probably sold by local dealers last week than for any other seven days since December. Consumption and production are once more becoming equalized, and the outlook is regarded on every side as hopeful. Mill Irons are 25¢ @ 50¢ more per ton than in January, and sellers seem quite determined to make no further unnecessary concessions.

Scrap Iron.—Old American Rails may now be quoted at \$21 @ \$21.50, with a few small sales reported at the latter figure. Stocks are accumulating.

Nails.—The market is quite firm, with indications of better prices within 30 days. Steel Wire Nails at \$2.40 are in fair demand.

Cincinnati.

Office of *The Iron Age*, Fourth and Main Sts., CINCINNATI, February 25, 1889.

Pig Iron.—There has been very little change in the local market for Pig Iron during the week. There have been but few, if any, developments which have influenced the markets, either for better or for worse. Prices have remained steady, as a rule, but there have been instances where very low rates have been made for a few hundred ton lots, which has contrasted strongly with the confidence indulged in for some makes of Iron. However, the general impression has been that the market has given evidence of improvement, although the volume of business has been only moderate and there is an absence of large trades. The transactions which have been made have been of small amounts and well distributed, the demand showing but little preference for either Forge or Foundry grades. The large sales of Car-Wheel Iron last week have not been repeated during the week under review. Among the larger sales have been 1000 tons No. 1 Southern Foundry at \$15, and 500 tons Virginia Iron equivalent to \$16.75 here. The following are the approximate prices current here at the close for cash, f.o.b.:

Foundry.

Southern Coke, No. 1 (new classification).....	\$15.00 @ \$15.50
Southern Coke, No. 2 (new classification).....	14.50 @ 14.75
Southern Coke, No. 3 (new classification).....	14.00 @ 14.25
Ohio Soft Stone Coal, No. 1.....	15.00 @ 15.00
Ohio Soft Stone Coal, No. 2.....	14.50 @ 15.00
Mahoning and Shenango Valley.....	16.50 @ 17.00
Hanging Rock Charcoal, No. 1.....	21.00 @ 22.00
Hanging Rock Charcoal, No. 2.....	19.00 @ 22.00
Tennessee and Alabama Charcoal, No. 1.....	18.00 @ 18.50
Tennessee and Alabama Charcoal, No. 2.....	17.00 @ 18.00

Forge.

Strong Neutral Coke.....	13.00 @ 13.50
Mottled Neutral Coke.....	12.50 @ 12.75
Gray Forge.....	13.00 @ 13.25

Car-Wheel and Malleable Irons.

Southern Car-Wheel.....	20.00 @ 25.00
Hanging Rock, Cold Blast.....	22.00 @ 25.00
Lake Superior Car-Wheel and Malleable.....	21.00 @ 22.00

Manufactured Iron.—The market for both Plate and Bar Iron has been quiet, but the market has remained steady.

Nails.—There has been a moderate demand, which has been readily met at previous prices: 12d @ 40d sell at \$1.90 @ \$1.95 ¢ keg, with 10¢ rebate in carload lots at the mills. Steel Nails sell at \$1.90 @ \$1.95, and Steel Wire Nails at \$2.60 @ \$2.65 ¢ keg.

Old Material.—The market has been without animation. Old Rails have been offered to a moderate extent at \$22, but

difficult to sell over \$21.50, cash. Old Wheels have met little demand, and ruled easy at \$18 @ \$18.50 ¢ ton, at present delivery.

Chattanooga.

Office of *The Iron Age*, Carter and 9th Sts., CHATTANOOGA, February 25, 1889.

Pig Iron.—It appears to be the general opinion among the producers that the worst is over. It is certainly a fact that producers are feeling much better than they were some two or three weeks ago, and are declining offers that are being made now, but which they would have entertained then, and are asking an average of 50¢ to 75¢ more per ton. On Friday last one of our Birmingham stacks sold 1100 tons No. 2 Foundry for \$12.80, cash on cars, and a sale of 500 tons of No. 1 by another furnace, to go to New York, was made at \$13.80, net cash in 30 days. The same furnace was solicited to duplicate the transaction, but declined to do so. A careful inquiry among a number of furnace owners developed about the same condition of feeling. Upon the subject of storage and warrant enterprise there is still a difference of opinion among producers as to its effects upon prices. The fact is that most of them are looking upon it with a feeling of indifference, and there is not the interest being taken in it that its promoters anticipated. The writer has yet to meet any producer who intends putting up a ton of their production and availing themselves of the warrants to raise money; still, if the project should materialize successfully there will probably be occasionally round lots placed and warrants issued for the purpose of raising money, but the project is creating no particular enthusiasm. There is another feeling among the Southern producers which so far has had but little mention, and that is they are averse to prices advancing more than \$1 to \$2 ¢ ton. The points that they make in their arguments are not worth while to mention, but, nevertheless, they exist, and from their standpoint are apparently well taken. There are very few producers in the South but what are enthusiastic as to the future of the Southern Pig Iron business, and as one of the best evidences of their convictions three of the largest and most successful concerns are now making arrangements to add two stacks to each of their plants, while the Eureka, at Oxmoor, has already commenced the erection of two more stacks to their present plant of two furnaces. Under the present conditions of the Pig Iron business, of the prospects of overproduction and present low prices it may seem premature to state that during the next five to seven years there will be not less than 25 additional furnaces erected in the Southern Iron-producing districts, and they will be of the very largest capacity and better equipped, if it be possible, than any yet built. During the past year the improvement of the better class of furnaces has been very great in economy of working as well as quality and quantity of their output, which has been very encouraging to their owners.

St. Louis.

Office of *The Iron Age*, 212 N. Sixth st., ST. LOUIS, February 23, 1889.

Pig Iron.—The market continues in an unsettled condition, and there are no transactions of any interest to report. More inquiry is reported, especially from manufacturing consumers, and indications point to an improving market with the advent of the spring months. Consumption is not large, but orders are coming in regularly, but in a small way, yet in the aggregate sufficient to prevent any large accumulation of stocks. Prices show no

change from last week, and the figures quoted below are generally adhered to, except in isolated cases. Furnaces seem disposed to maintain prices, and shrewd buyers are picking up odd lots whenever the opportunity presents itself. We quote as follows, for cash, f.o.b. St. Louis:

Southern Coke, No. 1 Foundry, \$15.25 @ \$15.75	
Southern Coke, No. 2 Foundry, 15.00 @ 15.25	
Southern Coke, No. 3 Foundry, 14.25 @ 14.75	
Gray Forge.....	13.50 @ 13.75
Ohio Softeners.....	17.50 @ 20.00
Lake Superior Charcoal.....	21.00 @ 21.50

Missouri.

Charcoal Foundry, No. 1.....	16.00 @ 16.50
Charcoal Foundry, No. 2.....	15.00 @ 15.50

Tennessee.

Charcoal Foundry, No. 1.....	17.50 @ 18.50
Charcoal Foundry, No. 2.....	16.75 @ 17.50
Connellsville Coke, f.o.b. East St. Louis, \$4.70; St. Louis, \$4.85.	

Bar Iron.—A small amount of business is being transacted at current rates. Sales are small and prices are steady, although in some cases sales are made that are considered to be pretty close to cost. Lots from store are quoted at 1.85¢ @ 1.90¢, according to quantity and quality.

Barb Wire.—The active demand which has characterized this department for some time past continues to be the feature, and it now looks as if there will be no cessation of work, as inquiries are coming in for some good-sized lots for delivery in the early spring. The open winter has enabled farmers to do considerable fence building, and the stock of Wire in the hands of retailers has been pretty well cleaned up. Prices, however, fail to show any improvement, although it is doubtful if any concessions would be made on the figures quoted herewith, even on the most desirable orders. Carload lots Two and Four Point Painted, \$2.90; carload lots Two and Four Point Galvanized, \$3.50, f.o.b. St. Louis; less than carload lots, 5¢ additional.

Pittsburgh.

Office of *The Iron Age*, 77 Fourth Ave., PITTSBURGH, February 23, 1889.

There has been nothing particularly new developed in the general Iron situation during the past week, with the exception of an increased movement in the raw article, which it is believed will lead to an improved demand for the products.

The failure of the Grand Lake Coal Company, reference to which was made in our last report, demonstrates that Southern coal is to a considerable extent supplanting Pittsburgh coal in some of the leading Southern markets. The failure of the company in question was in part caused by the losing of large Southern contracts, one of which was with the Morgan Steamship Line, at New Orleans. It has demonstrated that for general use, with the exception of gas, coal of Georgia and Alabama is about equal to that of Western Pennsylvania, and the cost of transportation is so much less that the Southern coal has the advantage in Southern markets. The river coal operators here are very much interested in having the National Government buy out the Monongahela Navigation Company and make the Monongahela River free of tolls. Our coal operators say they cannot compete with Southern coal in the South unless relieved of these oppressive tolls, and it is a matter in which the Southern people are very much interested.

Pig Iron.—There has been a considerably increased movement in Mill Irons the past week. Sales of several thousand tons have been made, some of them for future delivery, and the market, as might be expected, has stiffened up considerably. Nearly all the Iron in question reported was upon a basis of \$14.25, cash, for Gray Forge, but some furnaces are now refusing to make additional contracts at that price.

Bessemer Iron is also firmer, with some considerable inquiry. There has been an offer on the market for some days for a lot of 4000 tons at \$16.50, cash, without finding a seller, whereas a few weeks ago there was a large contract made at \$15.25, cash. Mahoning and Shenango furnaces are refusing to sell now in this market, and nearly all the business here for some months past has been done by city furnaces, who, some people think, are making an effort to shut outside furnaces out of this market, and, whether intentional or not, with considerable success this winter. Foundry Irons continue dull. We quote prices as follows:

Neutral Gray Forge.....	\$14.25 @ \$14.50,	cash.
All Ore Mill.....	15.00 @ 15.50,	"
White and Mottled.....	13.50 @ 14.00,	"
No. 1 Foundry.....	16.00 @ 16.50,	"
No. 2 Foundry.....	15.50 @ 16.00,	"
No. 1 Charcoal Foundry.....	22.50 @ 23.00,	"
Cold Blast Charcoal.....	25.00 @ 26.00,	"
Bessemer Iron.....	16.50 @ 16.75,	"

Muck Bar.—There has been little or nothing done the past week, and while there is not much offering the demand is light, and prices remain about as last quoted, \$27, cash. It is expected that there will be an improved demand before long, and, if so, a stronger market will doubtless be the result.

Spiegel.—Demand continues light, while prices remain unchanged. Small sales at \$28 @ \$29 for 20 % Ferro-manganese; 80 %, \$56 @ \$57, cash.

Manufactured Iron.—The market is still far from being what may be termed active, but there is more inquiry, and the indications are that business will improve from now on. Large buyers who have been holding off in order to buy at the lowest notch are now beginning to feel around, having about arrived at the conclusion that the time for placing their orders is near at hand. Prices remain unchanged. Bars at 1.70¢ @ 1.80¢; Plates, 2.1¢ @ 2.20¢; No. 24 Sheet, 2.70¢ @ 2.80¢, all 60 days, 2 % off for cash. Skelp Iron continues very low. Sales of Grooved are reported as low as 1.65¢, and Sheared at 1.90¢.

Wrought-Iron Pipe.—There is a continued fair business for the season, but prices continue unsettled, and, to makers, unsatisfactory. It is said that some of the Eastern mills have sold recently below prices quoted, and if so it is evident that they are hard up for business. Discounts may be fairly quoted as follows: On Black Butt-Welded Pipe, 57½ and 5 %; on Galvanized do., 55 %; on Black Lap-Welded, 67½ and 5 %; on Galvanized do., 57½ %; 2-inch Tubing, 11¢ ½ foot net; ¾-inch Casing, 85¢ ½ foot net; Boiler Tubes, 65 % off regular list.

Old Rails.—There have been no sales reported since our last; there is more inquiry, and sellers are inclined to the belief that as soon as the demand fairly set in there will be a considerably stronger market. The work of lifting has been suspended for several weeks past owing to the hard freezing weather; the visible supply is growing less; stocks in hands of consumers generally are much reduced.

Steel Rails.—Heavy Sections are still quoted at \$28 @ \$28.50, cash, at mill, but there is not much doubt that a desirable order could be placed for considerably less; the prices quoted are no doubt intended for small lots.

Blooms, Billets, &c.—Bessemer Steel Blooms and Billets are still quoted nominally at \$27.50 @ \$28, and Slabs at \$27 @ \$27.50; Domestic Bloom Ends, \$17.50 @ \$18, and Crop Ends, \$18 @ \$18.50.

Railway Track Supplies.—There has been no change in prices for a considerable time. Spikes, 2.10¢, 80 days, f.o.b. at works; Splice Bars, 1.70¢ @ 1.80¢; Track Bolts, 2.75¢ with Square and 2.85¢ with Hexagon Nuts.

Old Material.—Demand continues light and prices are offish. No. 1 Wrought Scrap, \$20 @ \$20.50; Wrought Turnings, \$18 @ \$18.50; Car Axles, \$24.50 @ \$25; Cast Scrap, \$14.50 @ \$15, gross; Cast Borings, \$11 @ \$12; Old Car-Wheels, \$19; Old Steel Rails, \$17.50 for short and \$20 for long lengths.

Detroit.

WILLIAM F. JARVIS & Co., successors to Chas. Himrod & Co., under date of Feb. 25, 1889, report as follows: While the situation remains practically the same as a week ago, there was one sale of 5000 tons of Southern Gray Forge and No. 8 Foundry made in this market during the week at the lowest price that has been made here for several years. The deliveries are to run through 10 months, beginning April. The majority of Southern furnaces refuse to name any such prices, but a few are evidently compelled to realize on their output, and this buyer, being a very desirable customer, was able to obtain the Iron at a very low price. Numerous inquiries for Lake Superior Charcoal are being made, and some buyers claim that a few furnaces are willing to shade quotations, but the best brands are held firm, and makers prefer to lose the orders rather than reduce prices. We quote for the present as follows:

Lake Superior Charcoal, all numbers.....	\$19.50 @ \$20.00
Lake Superior Coke, all ore.....	18.75 @ 19.25
Lake Superior Coke, cinder mixed.....	17.75 @ 18.25
Standard Ohio Black Band.....	18.75 @ 19.25
Southern No. 1.....	17.00 @ 17.50
Southern Gray Forge.....	15.00 @ 15.50
Southern Silvery.....	16.50 @ 17.00
Jackson County (Ohio) Silvery.....	18.25 @ 18.75
Old Wheels.....	18.50 @ 19.00

New York.

Office of *The Iron Age*, 66 and 68 Duane street, NEW YORK, February 27, 1889.

American Pig.—A fair amount of business is being transacted, and sellers generally insist that the tone of the market is better. It is a fact, however, that very low offerings continue to be made, notably of No. 2 Foundry. These are not to be confounded with Irons too low in silicon for Foundry purposes, which have been seeking a buyer for some time past. In fact, a lot of 1500 tons of such Iron is now in the market at a low figure. The Thomas Iron Company report having sold 12,000 tons of Gray Forge at \$14.75 at furnace. We continue to quote for standard brands Northern Iron No. 1, \$17.50 @ \$18; No. 2, \$16.25 @ \$17, and Gray Forge, \$15 @ \$16, all at tidewater.

Scotch Pig.—We quote: Coltness, \$20.50 @ \$21; Shotts, \$20 @ \$20.50; Langloan, \$20 @ \$20.25; Summerlee, \$20.25 @ \$20.50 and Dalmellington, \$19.25 @ \$19.50.

Plates.—We quote Iron Tank, 2¢ @ 2.2¢; Shell, 2.25¢ @ 2.4¢; Steel Tank and Ship Plate, 2.1¢ @ 2.25¢; Shell, 2.35¢ @ 2.5¢; Flange, 2.6¢ @ 2.75¢, and Fire-box, 3¼¢ @ 4¢.

Structural Iron.—We quote Sheared Plates, 1.9¢ @ 2¢; Universal Mill Plates, 2¢ @ 2.1¢; Angles, 2¢ @ 2.10¢; Tees, 2.4¢ @ 2.6¢, and Channels and Beams, 2.8¢ on dock for all sizes.

Bar Iron.—We quote: Carload lots on dock, half extras, Common, 1.65¢ @ 1.7¢; Medium, 1.7¢ @ 1.75¢, and Refined, 1.75¢ @ 2¢.

Steel Rails.—We note sales during the week aggregating between 18,000 and 20,000 tons by Eastern mills, chiefly to Eastern roads, about one-half of the quantity being taken by a coal road. Reports of low figures keep cropping up, but on the whole the active Eastern mills are firmer,

and are asking \$27 and upward. On the 1st of April the allotment is to be readjusted, the works which have sold no Rails or only a part of their quota yielding it.

Merchant Steel.—The demoralization in Merchant Steel continues. Spring Steel has sold in small quantities to consumer at 2.20¢, delivered, cut to length, four months flat, and 2¢ has been shaded for delivery in large quantities. Planished Machinery Steel has sold, delivered at Boston, at 1.90¢ for large quantities.

Spiegeleisen.—We note a recent sale at private terms to a mill in the Pittsburgh district of about 1000 tons. We quote \$27.50 @ \$28 for English Spiegeleisen, ex-ship.

Billets.—There is only a very light demand for Foreign Billets and Slabs, a part of the purchases being made for manufacturing Barb Wire and Nails for export. Basic Billets are quoted \$31.50.

Wire Rods.—Negotiations are pending for a fair-sized order. The market is a little off, there being some pressure to sell which tells in the narrow market which there now is for Foreign Rods. The only business of any consequence done lately was the sale of between 2500 and 3000 tons for the Pacific Coast. Domestic Rods are selling at Pittsburgh for \$41.50, so that at the same price at tidewater for Foreign Rods there is not any chance for any business inland.

Old Rails.—During the past few days the market has been very quiet and dull. There had been sales previously, aggregating about 4000 tons, part Southern Rails shipped to this port, and part Rails from store here. We quote \$23 @ \$23.50.

Scrap.—We note a sale of 200 tons of American No. 1 at \$22, on cars at Jersey City.

Rail Fastenings.—We continue to quote Spikes at \$2 @ \$2.10, delivered in large lots. Angle Bars are 1.75¢ @ 1.85¢, delivered. Steel Angles are coming into the market in increased quantities.

Metal Market.

Copper.—At the time of our last week's report spot Chili Bars and Good Merchantable were quoted in the London market £80, gradually declining to £79. 10/ yesterday, and futures of both from £75 to £67, which demonstrates the weak feeling on the other side as regards coming developments in connection with the syndicate. Sales in London aggregate 1000 tons for the week. It appears that a violent attack is just now being made in London by outside operators on everything connected with syndicate matters in the Copper trade, and that these parties are selling boldly the three months' futures at the present low quotation and all the year as low as £58. Here in the meantime absolutely nothing of interest occurred. The few lots obtainable from outside parties of Lake Copper, 16¼¢ to 16½¢, have to be paid for, while casting brands are obtainable at 15¼¢ to 16¢. This morning, London declined with spot Good Merchantable from £79. 10/ to £78. 10/, and futures from £67 to £66. Best Selected remained unaltered during the week at £79. 10/. Our own market closed steady at 17¢ @ 16¼¢, for Lake on the spot. On February 24 it was cabled from Paris that the formation of the Compagnie Auxiliaire des Métaux had finally taken place, that the shares thereof had not been offered on the market, having all been taken by the founders of the company themselves, who held their first meeting on Thursday last, on which occasion it was shown that 25 per cent. of the capital subscribed for of 40,000,000 francs had been paid in. Messrs. Hentsch, Masson and Quiedeville have been appointed managers for six years to come, and

Messrs. Danfert and Secrétan auditors. The Paris correspondent of the *Hamburg Börsenhalle* wrote, under date February 9: The negotiations between the Paris and English members of the Copper syndicate are still proceeding on the following basis: A French company is to be formed with a capital of 40,000,000 francs, which company at the same time is to be authorized first to issue 40,000,000 francs of bonds and furthermore 40,000,000 francs of bonds. This would constitute a capital of together 120,000,000 francs. But this is not enough, inasmuch as the *Société des Métaux* insists emphatically that the syndicate should authorize an additional issue of 100,000,000 francs in so-called warrant bonds. This issue is proposed to be made by the new company at a suitable moment in order to enable the same to carry the Copper monopoly to a safe issue. The total capital to be thus created would consequently finally reach the enormous amount of 220,000,000 francs, which it is true would enable the parties to pay for 110,000 tons of Copper and store them away. The idea of dividing the stock, a thing which heretofore was looked upon as so very important, would be dropped if the above financial plan were to be carried out, but this appears to be a matter pushed into the background by the fact that for a couple of weeks past the syndicate succeeded in selling some large lines of Copper. I am informed that the 40,000,000 francs of capital stock of the new company have been subscribed for, the greater portion of it, among others, by those English firms that took such a lively interest in the matter when it was first broached; it is therefore all the more to be regretted that the form of an English syndicate should not have been adhered to. I may also add that Baron Hirsch has made considerable advances to the *Société des Métaux* on Copper warrants, and that from all appearances the company is now financially stronger than it has been at any time previously. The company's shares are worth 547 francs to-day. The import of American Copper into Liverpool and Swansea from January 1 to February 16 has been 4576 tons Fine, against 3985 during the corresponding period of last year.

Tin.—Tin closed a week ago at £94. 7/8 for spot, winding up yesterday at £95, while futures advanced from £95. 2/8 to £95. 17/8, the sales made summing up 700 tons. In our own market there has been a good deal of irregularity, but more doing, some 50 tons changing hands soon after the first advance in London at 21.30¢ in the open market for spot, and on the Metal Exchange 10 tons March at 21.10¢, and 20 tons April at 21.30¢ @ 21.35¢, followed by sales of 40 tons spot at the Metal Exchange at 21.40¢, 10 tons March at 21.35¢, and 10 tons May at 21.50¢, sales in the open market at the same time summing up 100 tons at 21½¢ @ 21¼¢ on the spot. The exports of tin from the Straits Settlements to the United States last year amounted to 62,310 piculs, against 70,916 in 1887; 82,015 in 1886, 48,989 in 1885, 59,901 in 1884 and 114,284 in 1883. This morning London improved from £95 to £95. 10/ on the spot, and for futures from £95. 12/8 to £96. 5/-. In our own market 10 tons March sold this morning at 21.55¢, and spot closes at 21½¢ @ 21¼¢. **Tin Plates.**—While our own market has continued the reverse of active, leaving last week's quotations unaltered, Liverpool has been stiffening up in sympathy with steel plates, coal, oil, &c., and it now looks as though those parties who have been holding back orders for lower prices were not going to gain their point. We quote, large lines, per box: Siemens-Martin Steel, Charcoal Finish, \$4.75 @ \$5.50; Terns \$4.12½ @ \$4.25; Coke Tins, \$4.22½ @ \$4.30, and Wasters \$4.12½

@ \$4.15. The quotation in Liverpool is unchanged at 13/ for Coke Tin.

Lead.—Sales in the open market have been limited to 200 tons Common Domestic, all told, at 3.70¢ @ 3.75¢, the metal being held with greater firmness; but consumers, sufficiently stocked to meet the light demand for their manufactures, not feeling disposed to subscribe to any further advance. St. Louis has been quiet at 3.55¢, and our closing price to-day on a firm market is 3.70¢. London for the week remained at £12. 10/ for Soft Spanish and £12. 15/ for English Pig.

Spelter.—Has remained featureless, pending a revival in the spring demand, delayed by untoward weather. The Western market remained tolerably firm, while here the quotation for ordinary brands does not vary from 5¢, Silesian being neglected at 5.75¢. In London Silesian improved from £17. 7/ to £17. 10/.

Antimony.—A steady local demand has caused continual firmness in Cookson at 13.25¢, while Hallett has improved to 12¢, both being scarce and well held.

New York Metal Exchange.

The following sales are reported:

TUESDAY, February 26.	
40 tons Tin, spot.....	21.40¢
10 tons Tin, March.....	21.35¢
10 tons Tin, May.....	21.50¢
WEDNESDAY, February 27.	
10 tons Tin, March.....	21.55¢
80 tons Tin, April.....	21.55¢
10 tons Tin, April.....	21.40¢
10 tons Tin, March.....	21.40¢

Coal Market.

The Anthracite Coal trade is stagnant, making necessary a further restriction of production. For the week ending February 23 the total shipments from the mines comprised 505,197 tons, a reduction of 60,000 tons compared with the previous week and 157,000 compared with the corresponding week last year. Since January 1 the aggregate is 4,302,319 tons, against 4,573,682 tons for the same time in 1888. The situation causes much perplexity among the Coal operators, and will be the subject of an early conference with reference to prices and production. An official of one of the large corporations argues that the presidents or general managers of the Coal-producing interests should personally direct in these matters. He says "that some of the sales agents do not seem to consider whether or not the prices at which they offer to sell Coal will enable the managers to pay the interest on the debts of their companies or afford the stockholders any dividends; and, besides, they not being directly responsible to the owners of the Coal properties and railroads, take advantage of their position to cut and slash prices whenever it suits their own fancy, in order to effect sales, irrespective of the question of profits." A letter from Shamokin, Pa., of February 24, speaks of great suffering among the miners. The writer says: "Some idea of the general situation throughout the Schuylkill region may be obtained when it is known that of the 56 collieries operated by the Philadelphia and Reading Coal and Iron Company less than 20 are in operation, and but a few of these are working full time. This means that at least 20,000 of the workers in and about the mines of the Philadelphia and Reading Coal and Iron Company are now and have been for nearly ten weeks in enforced idleness, and as their condition is generally about the same as the condition of the miners and mine-workers here and at Mount Carmel the actual distress throughout the Schuylkill region may be approximated. It is estimated that in all there are not less than 30,000 to 40,000

miners and mine-workers in all the lower or Schuylkill region without work and without money."

At Philadelphia four of the Reading steam colliers are laid up and their crews discharged, trade being virtually at a stand-still, a well-known shipping man remarking that there is now more Coal at Port Richmond than before for 30 years. In the old Lehigh region the Coal and Navigation Company have closed all their collieries. New York sales agents still quote the regular schedule prices. Freight rates are all down, lower than a year ago.

The Government purchased 2000 tons of Coal from C. G. Barber & Co. of this city, at \$3.62½ per ton, for Samoa.

The internal dissensions in the Clearfield Consolidated Coal Company were on Saturday last carried into Court of Common Pleas at Philadelphia, but on Tuesday resulted in the appointment of the Guarantee Trust and Safe Deposit Company as receiver for the company.

The Bituminous Seaboard Association is said to have agreed upon the percentages of production for tidewater shipment. Several contracts have been closed in Boston.

Financial.

Now that a new Administration is about to be inaugurated at Washington, an interesting question arises respecting the future disposition of the Treasury surplus, but it is assumed that bond purchases will continue as in the past. The volume of trade through the country at large is increased, but there is reason to suspect that the improvement is mainly confined to speculative circles. Even with this abatement the indications are generally good and warrant a more confident tone. The movement of merchandise is larger, both by rail and by the ocean carriers. Exports of provisions are particularly heavy. The clearances from all Atlantic ports of provisions last week comprised 11,831,615 lb lard, which is larger by 8,000,000 lb than in the corresponding week of last year, and 6,573,917 lb of bacon, which is greater than last year by 1,500,000 lb. The tramp steamer *Kong Alf* reports having run the Haytian blockade at Gonarves, disposing of flour and potatoes at \$17 ¢ barrel; do. pork, \$30 ¢ barrel. In flour there is more export buying and there are fair orders for wheat for the United Kingdom, which is an agreeable change. Cotton is in more demand by British spinners. Coffee is supposed to be in a stronger position and sugar has a hardening tendency. Dry goods jobbers speak of the spring trade as opening auspiciously, with favorable reports from other centers.

The stock market was affected by contradictory reports from Chicago regarding the probable outcome of the efforts to form an interstate railway association, and it was not until Thursday evening that the news came that the presidents had decided to organize without the aid of the dissenting roads. Friday being a holiday, the news, although favorably received, did not have its full effect on Saturday. The Northern Pacific and the Union Pacific agreed to make an arrangement by which the lines in Oregon and in Washington Territory are to be operated by trustees. It is reasoned that with 18 roads active members, with another road in sympathy with it, and three remaining roads more neutral than inimical, the new association has promise of stability. Moreover, the trunk lines are believed to be well organized. Chairman Cooley is said to have recently expressed the opinion that the time for cautioning, counseling and advising railway men not to break the law had passed, and that prompt measures to exact the penalties provided by the national statute were all that was left to the

men who were authorized and directed by Congress to see that the law was observed and that offenders were punished. The coal shares were depressed by a resolution of the mining companies to suspend operations two days each week, some of them closing their collieries indefinitely.

United States bonds are quoted as follows:

U. S. 4½, 1891, registered.....	107½
U. S. 4½, 1891, coupon.....	109
U. S. 4, 1897, registered.....	128½
U. S. 4, 1897, coupon.....	128¾
U. S. currency 6s.....	120

The weekly bank statement from the clearing house in this city shows an increase in deposits of \$211,000, an expansion in loans of \$951,800, and a decrease in specie and legal tenders combined of \$1,502,700. The banks now hold \$15,740,150 above the 25 per cent. required by law, against \$15,200,425 in 1888, and \$11,393,000 in 1887. The currency movement was light. The low rates for money on call, and the heavy disbursements each month for interests and dividends create a demand for all good securities. On March 1 the Treasury will pay out interest then due on about \$170,000,000 4½ per cents, and the disbursements by railroads and other corporations at this center will reach a large total. In Boston alone they are estimated at nearly \$6,000,000. Quotations are 3½ for 60 to 90 days, 3¼ for four months and 4½ for longer dates. The demand for commercial paper is in excess of the supply. Railroad earnings show an improvement since rates have been maintained west of Chicago. An event in the financial world was the death of millionaire Flood, of California. Stocks which Flood in bonanza days sold for \$900 per share are now freely offered at \$5 and \$8. The two mines that paid \$46,000,000 in dividends are now consolidated. Wm. G. Bates was appointed receiver for the L. M. Bates Company. The old charges of discrimination against the trade of New York by through bills of lading from Western points to European seaports are again being heard. By this means grain can be delivered in Liverpool 2¢ or 3¢ cheaper than it could be if bought in New York and forwarded from here. The Treasury at Washington received on Saturday from the Philadelphia mint 2,000,000 standard silver dollars, the weight of which is 59 tons. The number of silver dollars now in the vault is 86,000,000, which is equivalent to 2887 tons.

Sterling exchange was firm at \$4.89½ for short, slightly below the gold exporting point. In London discount rates are softening, owing to impending gold arrivals from South America and largely increased arrivals from Australia. The total clearings of 42 cities for the week ended February 23 show an increase of 19.9% compared with last year, and 28.5% the previous week. Outside of New York the gain was 9.7%. New York increased 25.2; Boston, 17; Philadelphia, 13.3; Chicago, 5.7; Pittsburg, 8.3; Cincinnati, 9.6; Kansas City, 23.2; Milwaukee, 22.3; Omaha, 4.1; Denver, 26.8; Galveston and Duluth, 100%. St. Louis, San Francisco, Baltimore, New Orleans, St. Paul and Minneapolis all show a slight decrease. The Director of the Mint submitted to Congress his report on the production of gold and silver in the United States during the calendar year 1888. The gold product was 1,644,927 fine ounces of the value of \$33,175,000. This is about the same as in 1887. The silver product was 45,783,632 fine ounces, of the commercial value of about \$43,000,000, and the coin value of \$59,195,000. This is an increase of 4,515,327 fine ounces over the product in 1887. At the highest price of silver during the year the bullion value of the silver dollar was 75.5¢, and at the lowest price, 70.5¢. The director estimates the consumption of gold and silver in the

industries in the United States during the calendar year 1888 to have been: Gold, \$14,600,000; silver, \$3,280,000.

The imports of merchandise at this port during the week were valued at \$8,951,000, of which \$3,365,000 represents dry goods. Since January 1 the total is \$79,114,000, against \$75,902,000 for the same time last year and \$71,000,000 in 1887. The imports of specie were \$187,000 and the exports \$1,357,408. Since January 1 the exports of specie amount to \$5,242,000, as compared with \$4,204,000 for the same time in 1888.

British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, February 27, 1889.

During the early portion of the week large quantities of Chili Bars and Good Merchant Copper were purchased for syndicate account at £78. 10/. Afterward the syndicate agents raised their bids 17/6, carrying the price up to £79. 7/6. This brought out considerable demand from the "bears" for prompts for covering of short sales, the syndicate brokers then withdrawing. Outside holders have benefited largely by the advance, and are at present holding what few warrants they have left. Purchases for consumption have been small and are still restricted by the uncertain tone of the market. The opinion is entertained that the syndicate does not intend any movement in the direction of cornering the market, but will keep prices on a fair level. Three months' futures are still at a considerable discount and quoted to-day at £68.

After dropping to £93. 10/ the Block-Tin market has reacted sharply, the reported heavy shipments and the small buying for consumption having been offset by substantial support from large operators. Higher prices cabled from the States also assisted in the reaction, and the market still shows an advancing tendency.

Business in Tin Plate has been confined mainly to the purchase of a few special descriptions, mainly Steels, at 13/6. The general situation of the market is practically the same as a week ago. It is stated that the Wallesey Works will be erected at Liverpool.

The demand for Pig Iron of all descriptions has improved still further, and prices are again higher, with the tendency still upward. Scotch Warrants have advanced to 43/, and Makers' Brands are 1/ @ 2/ higher to-day than during the middle of last week. Hematites have also moved up 6d @ 1/ during the week, and Middlesboro' Pig is a good 1/ higher.

Old Material of all descriptions continues in slow demand, and it is believed that lower rates than those generally quoted have been accepted.

There have been no important changes in the market for Steel, as far at least as prices are concerned, and business continues quite brisk. The trade in Manufactured Iron is fairly active and at previous prices.

Cleveland Pig.—Dealings have been on a large scale, and prices show a further advance. No. 1 Middlesboro', G.M.B., 38/6; No. 3 ditto, 36/.

Bessemer Pig.—Sales have been made at 6d rise, and a further 6d advance is asked. The demand continues brisk. West Coast brands, mixed numbers, 46/6 @ 47/, f.o.b. shipping point.

Scotch Pig.—Business continues active, and prices are strong at the advance.

No. 1 Coltness, f.o.b. Glasgow.....	54/
No. 1 Summerlee, " ".....	55/
No. 1 Gartsherrie, " ".....	51/
No. 1 Langloan, " ".....	52/6
No. 1 Carnbroe, " ".....	45/6
No. 1 Shotts, " at Leith.....	54/
No. 1 Glengarnock, " Ardrossan.....	49/
No. 1 Dalmellington, " ".....	45/
No. 1 Eglinton, " ".....	49/6
Steamer freights, Glasgow to New York, 5/;	
Liverpool to New York, 10/.	

Spiegeleisen.—The market remains very firm, and is fairly active. English 20% quoted 80/, f.o.b. N. W. England shipping point.

Steel Rails.—Although not as active as last week the market is lively, with prices firm. Heavy sections quoted at £4. 5/, and light sections £4. 10/ @ £4. 17/6, f.o.b. at N. W. England shipping point.

Steel Blooms.—A fair business passing, but prices somewhat irregular. We quote £3. 17/6 for 7 x 7, f.o.b. at N. W. England shipping point.

Steel Billets.—There continues to be a good trade in these at firm prices. Bessemer, 2½ x 2½ inch, £4. 5/, f.o.b. at N. W. England shipping point.

Steel Slabs.—Somewhat larger sales reported, but at irregular prices. Bessemer, £3. 17/6, f.o.b. at N. W. England shipping point.

Old Rails.—The market remains quiet, with previous prices asked. Tees quoted at £3. 5/ @ £3. 6/, and Double Heads, £3. 8/ @ £3. 10/, c.i.f., New York.

Scrap Iron.—A moderate business doing at unchanged prices. Heavy Wrought quoted at £2. 2/6 @ £2. 7/6, f.o.b.

Crop Ends.—Only moderate sales making and prices unchanged. Bessemer quoted £2. 10/ @ £2. 12/6, f.o.b.

Tin Plate.—The market continues quiet. We quote, f.o.b. Liverpool:

IC Charcoal, Allaway grade.....	15/9 @ 16/3
IC Bessemer Steel, Coke finish.....	15/6 @
IC Siemens " ".....	15/9 @
IC Coke, H. V. grade.....	13/ @ 12/3
Charcoal Terne, Dean grade.....	12/6 @ 13/

Manufactured Iron.—Business still of good volume. Prices show slight changes. We quote, f.o.b. Liverpool:

Staff. Ord. Marked Bars.....	£ s. d. 2 5 0
Common " ".....	5 12 6 @ 5 15 0
Staff. Bl'k Sheet, singles.....	7 12 6 @
Welsh Bars (f.o.b. Wales).....	5 0 0 @ 5 2 6

Copper.—The market showing better tone, but rather quiet. The quoted prices are: Chili Bars, £79. 10/ for spot, and £68 for three months futures. Best Selected, £79 nominal.

Tin.—The demand fairly active and the market firm. Straits quoted at \$95, spot, and £95. 15/ for three months' futures.

Lead.—There has been only a moderate trade. Quoted at £12. 10/ for Soft Spanish.

Spelter.—The market stronger and more active. Quoted at £17. 10/ for ordinary Silesian.

It is reported that Merion Furnace West Conshohocken Pa., has chilled.

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Hardware.

During the present month a good business has been done and it draws to a close with a general activity which should be in volume generally satisfactory. Most houses, including jobbers, commission merchants and manufacturers, report the month's business as being slightly in excess of last February's, but complaint is often made in regard to the narrow margins of profit, owing to the low prices prevailing on nearly all goods which are not in combination. The past week, however, has not witnessed any reductions in price of any importance, and in some lines the market is characterized by a greater firmness. There is some complaint of sluggishness in collections, but the financial situation is regarded as good, and the outlook for a satisfactory season's trade is favorable.

Cut Nails.

There has been some irregularity in prices, due to pressure to sell on the part of one large mill. We continue to quote \$1.80 to \$1.85 for carload lots on dock, and \$1.90 to \$1.95 for small lots from store, with the market in buyers' favor.

Wire Nails.

The market continues without especial change in feature, the prices which have lately ruled still continuing. Some of the manufacturers are showing less disposition than others to accept ruling prices, but the quotation of \$2.30 on average assortments, carload lots, at mill, is still continued. The usual advances for small lots from store are made.

Barb Wire.

The agreement between the Eastern manufacturers gives regularity to prices ruling in this market, but the transactions are very limited.

Miscellaneous Prices.

At a meeting of the manufacturers of Axles the following revised discounts were adopted, terms four months, 3 per cent. discount for cash in 30 days:

Nos. 7 to 14	55&5 %
Nos. 15 to 18	47½ %
Nos. 19 to 22	70 %

Revised prices are also announced on heavy Axles which are sold at new figures. The condition of the market in this line of goods is referred to as satisfactory and the volume of trade as being good.

The Arms-Bell Company, Youngstown, Ohio, are paying special attention to the manufacture of Cold Punched Nuts, and in particular to Chamfered and Trimmed Nuts suitable for engines and other finished work, as well as to Railroad Track Bolts, of which they make all styles and shapes. The following quotations indicate the principal goods manufactured by them and the prices at which they are offered; terms 60 days, or 2 per cent. discount for cash in ten days:

	Discount.
Carriage Bolts	75&10 %
Machine Bolts	80&30&5 %
Bolt Ends	80 %
Lag Screws	80&5 %
Flaw Bolts	65 %
Tire Bolts	70&10 %
Square Nuts, hot or cold	5 4¢ off list.
Hot Pressed Hexagon Nuts	5.90¢ off list.
Cold Pressed Hexagon Nuts	5.50¢ off list.
Chamfered and Trimmed Nuts	5.20¢ off list.
Washers	5.50¢ off list.

Items.

The change in the last classification, by which Hardware not exceeding 5 cents per pound in value, was placed in third class, as noticed in our last issue, is regarded by the trade with satisfaction as giving a reduced rate on many heavy

goods and as being a step in the right direction, and the large jobbing houses, by whose efforts this change was effected, are entitled to congratulation for the result achieved. As some in the trade are aware, the Simmons Hardware Company, and other jobbers in the West, made a systematic effort to have Hardware placed in third class, and, while they have not succeeded in accomplishing this, the change above referred to is largely due to their efforts.

The trade will learn with regret of the death on Sunday last of W. B. Belknap. Louisville, Ky., founder of the house of W. B. Belknap & Co., of that city.

The exports of Hardware from New York during January comprised 13,028 packages, valued at \$208,615, and of Cutlery 1377 cases, valued at \$24,687. Exports of Machinery in the same month were valued at \$286,624.

Chase, Taylor & Co., Kalamazoo, Mich., issue circulars announcing that they have been granted by D. C. & H. C. Reed & Co., Kalamazoo, Mich., a license to sell their patent Spring Tooth Harrows in all territory west of the States of New York, Pennsylvania, West Virginia and Virginia, under the Reed patent No. 201,946; and also that they have been granted by G. B. Olin & Co., Canandaigua, N. Y., a license to sell them in the New England States, New York, Pennsylvania, New Jersey, Delaware, Maryland, Virginia and West Virginia. They also issue a circular giving description of this Harrow and referring to its advantages.

Canton Saw Company, Canton, Ohio, issue a convenient price-list, 46 pages, describing their Solid and Inserted Tooth Circular Saws, Knight's Patent Sawmill Dogs, Sec-Saw and Merry-go-Round and other goods which they are offering.

Among the special notices on page 48 will be seen one in which Clement M. Biddle & Co., 815 Arch street, Philadelphia, Pa., announce that a Southern jobbing house wishes to engage a salesman acquainted with the coal-mining and furnace-supply business. We understand that for one having the requisite qualifications the opening thus presented is a favorable one.

Enterprise Mfg. Company, Philadelphia, Pa., for whom J. C. McCarty & Co., 97 Chambers street, New York, are agents, are putting on the market a convenient arrangement by which their Mrs. Potts' Sad Irons are furnished in family outfits. For this use they are put up in cases, each case containing a set of Sad Irons, a Polish-iron and a Girl's Iron, either nickel-plated or plain polished. Their circular relating to these goods illustrates the outfit and indicates its utility.

The name of King's Great Western Powder Company, Cincinnati, Ohio, has been changed to The King Powder Company. In announcing this change of title the company refer to its fitness, as it has no need of high-sounding titles to recommend itself or its goods, and much valuable time will be saved in writing the name, while the liability of error in its use will be reduced to a minimum. The new name went into use February 25.

A fire occurred this morning in the factory of G. & H. Barnett, File manufacturers, Philadelphia, but we are glad to be able to state that it affected only one portion of the works, and will not long delay operations, as it is expected that work will be resumed in a few days.

The Le Page Company, Gloucester, Mass, for whom Tower & Lyon are agents, 95 Chambers street, New York, have prepared Wire Stands of neat design for the convenience of dealers exhibiting and selling their Improved Process Glues. They

are intended to be placed on counters or in show windows. The cases are made to contain four different assortments of Glue, and the price of each case is the regular price of the Glue.

Russell & Erwin Mfg. Company, New York, are putting on the market a new patent Window Sash Cord and Clothes Line. It is made of wire woven around a core, and is referred to as combining durability, strength and flexibility. It is claimed that it will not stretch, does not chafe and wear, and will not fuzz, while it also costs no more than common sash lines. It is put up in pieces of 100 feet, 12 pieces in a package, and can also be had in coils or on reels of any length, as may be desired. It is made in only one size, which is referred to as strong enough for the heaviest weights and obviates the necessity of keeping several lines in stock.

To replace an engine which surrendered to the inevitable last Monday, Sargent & Co., of New Haven, will inaugurate on the 4th of March a pair of 850 horsepower Harris-Corliss steam engines, with 42 x 20 inch cylinders, balance wheel weighing 25,000 pounds, 18 feet diameter, and 38-inch face. In order to meet emergencies Sargent & Co.'s steam power has been so arranged that all the four separate and complete systems or groups of the establishment can be connected, and any or all departments can be run from one or more of the engines placed in the various localities, so that now the whole works are running driven by power borrowed from the other six engines on the premises, and the usual production of goods is obtained. We understand that the two new and powerful engines will be christened Harrison and Morton.

The Heavy Hardware Jobbers' National Union met in session at Indianapolis the 20th and 21st insts., but nothing was done which has any special bearing upon the market at the present time. There is a movement on foot to form a similar association of Eastern jobbers. The object of the associations will be to combine their efforts in correcting abuses in the trade.

John Pritzlaff Hardware Company, Milwaukee, Wis., have issued their circular No. 4, February, 1889. It is devoted to seasonable goods, such as Forks, Hoes, Rakes, Scythes, Sheep Shears, Corn Planters, Freezers, Screens, Spring Hinges, Wheelbarrows, Refrigerators, &c. Tin Plate, Sheet and Galvanized Iron, Barb Wire and Tinware are also represented in the circular.

The Atlanta Saw Works, Atlanta, Ga., issue an illustrated catalogue and price list showing the line of Saws which they manufacture. It covers Circular, Mulay, Mill, Crosscut, Gang and other Saws, of which list prices are given, with information useful to sawyers and others interested in the manufacture of lumber. The company make a specialty of very thin Circular Saws, and give particular attention to repairing.

Byram & Co., Detroit, Mich., successors to the Colliau Furnace Company, issue a catalogue describing the Colliau Patent Cupola Furnace, of which a full description is given, with illustrations of the different sizes and patterns, and testimonials from leading founders who have used it.

L. C. Beardsley & Co., Cleveland, Ohio, have issued a neat catalogue describing their manufactures, including Pails, Oil Cans, Harness Oil Cans, Syrup Cans, Gasoline Stove Reservoirs, Street Lanterns, Steel Stove Shovels, the Economic Self-Basting Steam Roaster, Felloe Plates, &c.

Vaughan & Bushnell Mfg. Company, Chicago, Ill., have issued a revised price list of their special wrought goods. It

relates to such articles as Nail Grips and Claws, Grappling Hooks, Eye Bolts, Heavy Hasps, Ice Tongs, Clothes Line Hook, Hitching Rings, Leader Hooks, &c. Their well-known Post Hole Auger is also represented, and it is stated that they have made and sold over 250,000 of them since the date of patent.

E. D. Clapp Wagon Company, Auburn, N. Y., have issued a new catalogue relating to their Wagons and Bob Sleighs, in

ized iron instead of zinc. Emphasis is laid on its excellence as a hard wood and dry air Refrigerator.

Horizontal Freezer Company, Port Byron, Ill., and Philadelphia, Pa., issue circulars relating to their Horizontal Freezers for which they solicit trial offers. They advise us that their large machines are nearly all sold to customers on trial, and that dealers are permitted to sell on the same condition. The Freezer is referred

is furnished with glass doors. This is referred to as a very desirable way to keep Hand Saws, and as being much better than having them in drawers or hanging them up. In the front of the store, occupying the middle of the room, there is a light strong rack arranged in steps, Fig. 320. It is 10 feet long, 3 feet wide at the base, 4½ feet high. There are in it four steps 10 inches wide. A 3-inch strip is nailed under them as a support. On this rack Granite-Ware, samples of Coun-

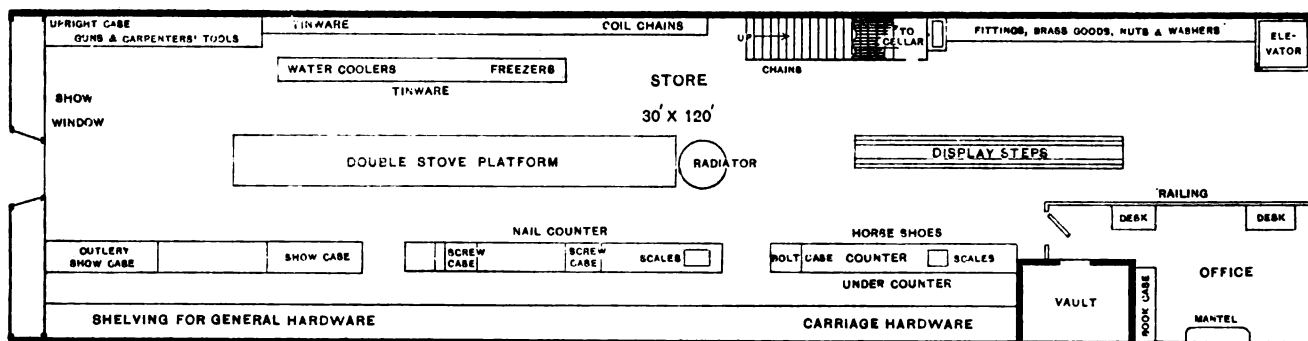


Fig. 318.—Store of C. V. B. Barse & Co., Olean, N. Y.

which leading patterns are represented, with descriptive matter. They emphasize the excellence of their Steel Axles, and in selling their Steel Axle Wagon give a guarantee that they will replace, free of charge, every broken Steel Axle, no matter what the load may be or the circumstances under which it broke.

E. C. Meacham Arms Company, St. Louis, Mo., have issued their price current No. 400, February 11, 1889. It has 16 pages devoted to Arms, Ammunition, Tents, Roller Skates, Cycles, &c.

Paine, Diehl & Co., Philadelphia, Pa., have issued a volume of 84 pages, entitled, "P., D. & Co., Keystone Cook Book," which contains a number of receipts for dishes in the preparation of

to as giving better satisfaction than ever, as it is more carefully made, and the company expect to largely increase the sale to dealers.

Arrangement of Stores.

The illustrations herewith given, Figs. 318 to 322, relate to the Hardware store of C. V. B. Barse & Co., Olean, N. Y. The store, Fig. 318, is 30x120 feet, inside measurement, the first and second floors and the cellar being devoted to the business. In the rear is a storehouse about 32x90 feet, where Nails, White Lead, Sheet Iron, Bar Iron, &c., are kept, the tin shop occupying a portion of it, as shown in Fig. 319. There is a bank entrance to the store, with a door which slides up out of the way. It will thus be seen that the

ter Scales, Lanterns, Wringers and various other goods are accommodated. We are advised that it is found very convenient and satisfactory in use. It is stained cherry, making an attractive appearance. The method in which Steel Squares are accommodated is shown in Fig. 321. In this rack there are six steps 3 inches wide, the risers being also 3 inches. The top shelf is 6 inches wide, made of ½-inch stuff, and on this a row of Bonney Vises is fastened. The Squares are kept in paper boxes, and as the price of the Square is marked on the box, the desired quality is readily selected. Each shelf holds a dozen Squares. Fig. 322 shows a sample case which permits the effective display of the goods for which it is used. The show board inside the case is covered with black velvet and

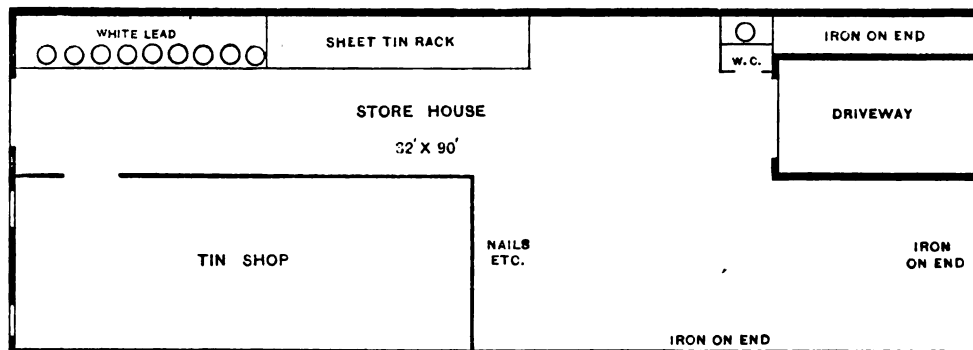


Fig. 319.—Plan of Storeroom.

which the Keystone Beaters may be used. A brief description of these Beaters, Nos. 1 and 2, is also given, while attention is likewise paid to their Self-Pouring Tea and Coffee Pots, Potato Masher, Egg Beater, Press and Strainer and other articles of their manufacture.

R. Armiger & Son, Baltimore, Md., have issued their catalogue and price list of Refrigerators for the coming season. It is divided into four sections devoted as follows: *Section 1.*—Alpine, Horizontal and Chest Refrigerators and Grocers' Chest. *Section 2.*—Buffet Refrigerators, including the Victor, Daisy, Beauty, Charm, Regal and Princess. *Section 3.*—Climax Refrigerators; and *Section 4.*—Sterling Refrigerators. The latter is referred to as an entirely new Refrigerator, added this season, made of solid oak in antique finish, and also a poplar handsomely grained in oak color. It is lined with heavy galvan-

firm has excellent quarters for the accommodation of their important business, and their store is regarded as excellently equipped and arranged. On entering the front door, Fig. 318, there is on the left an upright case which is made of walnut, and is 15 feet long, 2 feet deep, and 8½ feet high. The under part has eight paneled doors, while the upper section is furnished with eight glass doors. This case contains Mechanics' Tools, Guns, fancy Tea Pots, &c., the lower part being occupied with surplus stock. Just beyond this there is a case for Saws. This case is 3 feet 4 inches wide, 3 feet 6 inches high, and 34 inches deep. It contains four shelves, on which are strips about 5 inches wide standing on edge, with grooves sawed in about 1½ inches apart. Saws are placed lengthwise in these grooves, each kind being kept on a shelf by itself. The case

is supported in place by small black-walnut posts placed in each corner. In these a small brass rod is inserted, on which are hung a fine line of Dog Collars, the extra stock being kept in the boxes below. Believing that hanging goods in sight helps sales, this enterprising house advise us that they avail themselves of every spare place on the wall to hang something in sight, as, for example, along the stairway and on the wall up the stairs to their second story they have strips to which they hang Chains, Steelyards, Shovels, Scoops, Manure Forks, &c.

Exports.

PER BARK TEOCLE, FEBRUARY 20, 1889, FOR WELLINGTON, NEW ZEALAND.

By Arkell & Douglas.—3 dozen Wringers, 2 packages Plated Ware.
By McLean Bros. & Rigby.—6 Anvils and Vises, 3 dozen Hog Ringers, 3 dozen Hay Forks, 2 dozen Door Bells.

By H. W. Peabody & Co.—100,826 pounds Barb Wire, 2 cases Agricultural Implements, 269 dozen Handles, 2240 pounds Grease, 400 pounds Nails, 58 packages Hardware, 9 cases Stoves, 1 case Pumps, 9 dozen Whetstones, 2 packages Plated Ware, 3 cases Wringers, 2 packages Agricultural Implements, 1 case Wringers, 18 packages Hardware, 1 case Pencils, 21 packages Carriage Ware, 5 packages Lamp Ware, 120 cases Edge Tools.

By R. W. Forbes & Son.—11 dozen Garden Rakes, 1 case Hardware, 7½ dozen Rake Handles, ½ dozen Combined Drills, 29 dozen Axe Handles, 6 cases Hardware, 36 dozen Axe Handles, 5 dozen Bush Hooks, 6 dozen Garden Rakes, 1 case Hardware, 189 dozen Shoe Blacking, 4760 pounds Nails, 20 dozen



Fig. 320.—Rack for Granite-Ware, &c.

Axes, 190 dozen Axe Handles, 20 dozen Axes, 9 dozen Harness, 2½ dozen Clothes Wringers, 20 dozen Shovel Handles, 15 dozen Garden Rakes, 3½ dozen Churns, 20 boxes Carpet Tacks, 7 cases Hardware, 2 dozen Clothes Wringers, 19 cases Hardware, 22 dozen Rake Handles, 50 gross Clothes Pins, 4½ dozen Churns, 120 boxes Clothes Pins, 450 dozen Axe Handles, 25 dozen Axes, 44 packages Hardware, 500 gross Clothes Pins, 5 gross Sewing Machine Oil, 1000 dozen Axe Handles, 8 dozen Churns, 74 pounds Rubber Springs, 12 dozen Spade Handles, 4 packages Lampware, 48 packages Carriage Ware, 60 dozen Axe Handles, 3½ dozen Wringers, 1 case Hardware, 135 pounds Rubber Springs, 6 dozen Spade Handles, 23 packages Hardware, 500 pounds Horse Nails, 1 crate Carriage Ware, 1 box Harness, 14 gross Blacking, 907 pounds Horse Nails, 6544 pounds Horse Nails, 3206 pounds Horse Nails, 9 cases



Fig. 321.—Steel-Square Rack.

Hardware, 4 cases Hardware, 30 dozen Axes 49 dozen Axes, 6 dozen Axes, 10 dozen Axes, 88 dozen Axes, 5 dozen Spades, 8 dozen Scoops, 4 cases Hardware.

By W. H. Crossman & Bro.—½ dozen Padlocks, 11 Whiffletrees, 1500 pounds Nails, 6 nests Pails, 4 dozen Grindstone Fixtures, 12 packages Hardware, 25 Lawn Mowers, ½ dozen Scales, 5 packages Lamp Goods, 18 cases Handles, 4 cases Plow Parts, 1 bundle Carriage-Ware, 8 Dashers, 100 pounds Nails, 2 Drills, 8 rolls Sandpaper, 194 pounds Stone, 1690 pounds Axle Grease, 38 dozen Axes, 20 dozen Rakes, 1 case Hardware, 4 cases Agricultural Implements, 10 dozen Hammers, 18 dozen Hatchets, 28 Churns, 1 crate Tire Benders.

By A. S. Lascelles & Co.—30 cases Slates.

By Singer Mfg. Co.—685 Sewing Machines.

By Russell & Erwin Mfg. Co.—6 cases Hardware.

By Collins Co.—10 dozen Picks.

By Peters & Calhoun Co.—1 case Sadlery.

By New York Belting and Packing Co.—1 case Emery Wheels, 1780 feet Rubber Belting.

By Goulds Mfg. Co.—55 Pumps.

By Plumb, Burdick & Barnard.—6000 Carriage Bolts.

FOR AUCKLAND.

By Manhattan Brass Co.—18 packages Brass Goods.

FOR NAPIER.

By Manhattan Brass Co.—6 packages Lampware.

FOR NELSON.

By McLean Bros. & Rigg.—¼ gross Blacking, ¼ dozen Hay Knives, 1 dozen Leather Dashers, 2 Carpet Sweepers, 1 dozen Clocks, 200 Pot and Kettle Scrapers, 7 packages Carriage-Ware, 12 Stoves, 1200 Clothes Pins, 6 dozen Washboards, 81 dozen Handles, 3 dozen Axes.

By Arkell & Douglas.—396 pounds Axle Grease, 30 Ranges, 3 dozen Hammers, 24 dozen Handles, 4 dozen Axes, 12 dozen Picks, 12 dozen Handles, 1000 Cartridges, 2 dozen Forks, 1 gross Axle Grease, 2 Sprinklers, 6 dozen Mattooks, 8 Mangles, 5 crates Churns, 1 case Hammers, 825 pounds Nails, 1½ dozen Wringers, 7 cases Hardware, 336 pounds Nails, 5 cases Castings, 7 gross Sewing Machine Oil, 2 dozen Wrenches, 1 dozen Glue, 12 dozen Wire Goods, 3000 Hooks, 21 pounds Iron Washers, 1 case Hardware, 20,000 Cartridges, 3 dozen Blacking.

By H. W. Peabody & Co.—1 case Agricultural Implements, 44,800 pounds Barb Wire, 12 dozen Washboards, 75 dozen Brooms, 71

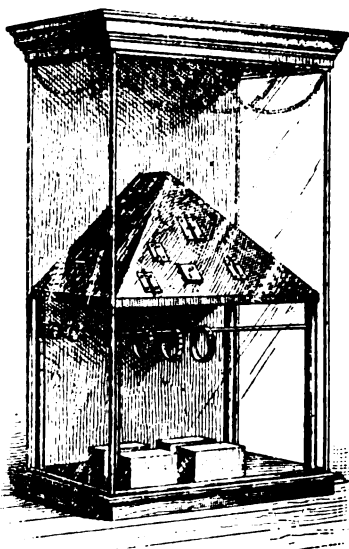


Fig. 322.—Sample Case.

packages Hardware, 12 dozen Sewing Machine Oil, 5 packages Lawn Mowers, 8 cases Firearms, 31 cases Slates.

Business Methods.

With reference to the question referred to by our correspondent in a recent issue as to the best method of keeping account of goods on hand, we have the following letter from a Hardwareman in Illinois:

As regards keeping an account of stock, as per your article in *The Iron Age* of February 14, I desire to say that, with the many small sales made in a retail Hardware store, it would be impracticable, and almost impossible, to keep an accounting so as to take an inventory at the end of the year from the books. Most retailers put the cash from cash sales in the drawer without any account, and at night charge the cash account with the aggregate amount made up of many sales, large and small. Thus we have but one entry on the cash book to keep track of the cash, where it would take a great many entries to keep track of the many small merchandise sales. We think where an accounting is kept of all merchandise going out it would be more trouble to find amount of stock on hand from the books than it would be to take an account of stock. For instance, a customer comes in and buys a package of Tacks, a Fork Handle, 10 cents worth of Copper Rivets, a 10-cent File and a box of Hog Rings; next man wants 5 cents

worth of Sandpaper, a pair of Butts, a Thumb Latch and a Bull Ring. And so it goes all day. It would take as many accountants to keep track of all these small articles as it would clerks to sell them. Where goods are kept in nice, clean shape it is no trouble to take an inventory at the end of the year.

It seems to us to be entirely unnecessary, and altogether too expensive for the retailer who pretends to have any trade, to keep an accounting of stock for the purpose of making out his want list. Our system of keeping up our stock is—first, to keep everything in its place and have a place for everything; then for each clerk, the boss included, to keep a small memorandum book in his pocket, and when any article is sold out, or getting low, to make a note of such. Now, when we get a card from blank's salesman saying he will call on a certain day, we make a list of such goods as we will want to buy of him, from our various memorandums, the day before the salesman is expected, go to the stock and see that we really need them, and give our order when he calls. In this way we know just what we want, no guesswork, do not order duplicates of what we have already in stock, and save time for the salesman, something they all appreciate. We have seen the boss sit down with the salesman and go through the catalogue, skipping things he ought to buy and buying others he did not need, taking up his own time as well as the salesman's, all for not having a want list.

Trade.

Wells & Nelligar Company, Chicago, Ill., have issued a price current under date February 19. It relates to Railroad Milk Can Stock, Steel Goods, Showcases, Clevises, Galvanized Wire, Bird Cages, Baby Carriages, Guns, &c. It is prefaced by the following remarks in regard to business:

HARDWARE.—Our business in 1888 was the largest that we have ever had in 12 months, which we attribute in part to succeeding to the Keith, Benham & Desendorf trade, also to the class of goods for which we are headquarters and the low prices and prompt shipments which we are making. We feel confident that volume of trade will be still larger this year, with firmer and higher prices, as Hardware will certainly be no lower.

NAILS.—The demand is very great for both Wire and Cut Nails, and the recent manufacturers' advance will before long necessitate higher prices in this market.

BARBED WIRE.—Is still being sold at very low rates, and buyers are paying closer attention to quality than heretofore.

The following review of the San Francisco Hardware and Metal trade, for the past year is given by the *San Francisco Journal of Commerce*:

The Hardware and Metal trade was, on the whole, 25 per cent. larger than in 1887—in some cases much larger. The increasing population of the State, and our extraordinary and varying manufactures, are the direct cause of this. Our manufactures of Agricultural Implements, Iron and Steel Wire, &c., are very important, and are daily increasing in extent and value. Our Canned Goods and Salmon industries called for an especially large supply of Tin Plate. There will be a large increase noted in the business of 1889. The volume of the business done was as follows:

Agricultural Implements.....	\$3,000,000
Iron and Steel.....	6,100,000
Hardware.....	8,000,000
Tin Plate.....	1,400,000
Quicksilver.....	1,415,000
Wire and Wire Goods.....	2,000,000
Pig Iron.....	430,000
Nails.....	1,100,000
Various.....	100,000

Total.....\$18,445,000

Agricultural Implements.

Imports in—	Pounds.
1884.....	15,300,890
1885.....	12,681,000
1886.....	11,999,810
1887.....	16,722,320
1888.....	20,790,440

Imports by rail have thus been much larger than in 1887. The business of the year may be reported as good, while the development of the California industry has exceeded expectations. Our home industries are steadily increasing in importance and in suitability to the needs of the State. The heavy rains insure an extra good demand for 1889. The steady settlement of both sections of the State should insure an even larger than ordinary demand. Then, too, our farmers are becoming more careful and more scientific in their methods of cultivation, and are constantly on the lookout for the latest and most improved Agricultural Machinery.

The Quincy Mine.

The pleasant effect upon the balance sheets of the copper mining companies of the cornering operations of the syndicate is well illustrated by the annual report of the Quincy Mining Company. The product of the mine was 7,762,945 pounds of mineral, yielding about 88.10 per cent., or 6,867,809 pounds of refined copper, for which was realized the gross sum of \$1,014,315.38, silver produced adding to the revenue \$4173.04. The running expenses of the mine were \$360,585.39, and the smelting, transportation and all other expenses, \$106,841.84. In addition to this, \$38,438.01 were spent for building and construction, \$67,117.37 for the Quincy and Torch Lake Railroad, and machinery was contracted for to the extent of \$75,000, leaving as a mining profit \$375,510.81. From interest on loans and sale of real estate additional funds were obtained, making the income \$386,250.66. Adding the balance of January 1, 1888, of \$536,509.75, there was available for dividends \$922,766.41. There was actually paid out in profits in 1888 \$360,000, leaving a balance on January 1, 1889, of \$562,766.41, out of which \$200,000 has been since declared in dividends. The company had an original paid-up capital stock of \$200,000, and have during their existence paid on this amount \$4,970,000. The greater part of the product of the mine is obtained from stamping rock, 117,514 tons being crushed, which yielded 3.04 per cent. of mineral. The company decided during the year 1888 to build a new mill, located at Torch Lake, to connect with which the construction of the Quincy and Torch Lake Railroad was begun. It is expected that this road will be in running order early the coming summer. It will be six miles long, with an almost uniform grade of 90 feet to the mile. The preparations for building the new stamp mill at Torch Lake are under way, contracts being let for two steam stamps of the latest design capable of crushing 250 tons of rock per day. A third steam stamp is to be added later. The plant includes an 8,000,000 high duty pump engine, one 14 x 36 inch Corliss engine, six 6 x 16 inch return tubular boilers, and 56 iron jigs. It will be seen, therefore, that this new equipment promises to increase the capacity of the mine by about 50 per cent., so that when it is in full operation the yield annually should be close to 9,000,000 pounds fine. In 1887 the earnings of the company on a product of 5,609,762 pounds of ingot were \$187,728.29. Practically the high prices running during 1888 have doubled the profits of the mine.

In a circular to manufacturers, the Board of Trade of Tiffin, Ohio, offer as inducements for locating there free natural gas and free building sites. During the past eight months the following companies have located there: A. J. Beatty & Sons' glass works, employing 400 men; Tiffin Glass Company, 200 men; Belgian Glass Company, 100 men; Ohio Lantern Company, 75 men; American Pulp and Paper Company, 100 men; Western Crayon Works, 50 men; Glick & McCormack's wagon supply works, 40 men; Brewer Pottery Works, 600 men, and the Sterling Wrench Company, 75 men. Tiffin has first-class railroad facilities, has water works and sewer system, and incandescent and arc light stations.

Harper's Weekly publishes in its last issue an article on the Robert process, accompanied with an illustration of a Bessemer converter of preposterous dimensions. It would be altogether useless to criticize the report in question. Suffice it to say

that the writer claims the following: "The entire plant, including engines and all the necessary machinery for the production of 100 tons a day of any grade of iron or steel, can be built for less than \$10,000, or one-third the cost of the Bessemer plant of the same capacity. The tuyeres of a Bessemer converter must be renewed after 15 blasts. The tuyeres of the new last for 250 blasts. The Bessemer converter must be relined after a very few blasts, the Robert after 1000 blasts." It is fair to assume that the writer knows as much of the Robert process as he does of Bessemer steel manufacture.

The New Submarine Boat.

The bid of the Columbia Iron Works, of Baltimore, for the construction of the submarine torpedo-boat desired by Secretary Whitney is the only one that can be accepted. That of Mr. Baker, of Des Moines, does not contain the necessary guarantees, while the Baltimore company offer them, and this company are now building the gunboat *Petrel* for the Navy Department. The Holland boat, an improvement on which it proposes, is familiar in New York waters, having shown in North River trials, witnessed by thousands of people, its powers of diving and rising at will, and of going a certain distance under water.

The great problem is as to what this practicable distance beneath the surface is. Many boats can go all day, and perhaps all night added, with a mere curved back surmounted by a cupola showing. But what is wanted is the distance a boat can go with nothing showing. In other words, the true problem is a submarine boat that can sink miles distant from the enemy and guide herself under water to that enemy. The storm of heavy projectiles now available from Hotchkiss cannon and rapid-fire guns makes the show of even an armored conning tower perilous. The custom is, in talking of such inventions, to dwell on the enormous size of the dynamite torpedo that can be exploded beneath the hostile hull. That, however, is not the immediate question at all. The first thing is the power of travel and guidance completely under water. With that once accomplished, a torpedo as big as a balloon can be used if the inventor likes. The results of the explosion of gun cotton or dynamite need not be dwelt on; the only question is as to carrying it with certainty to the place where it is to be applied.

The Columbia Iron Works apparently propose a boat that will do this, although the exact specifications of a contract may reveal some shortcoming in the exceedingly difficult task. Submarine boats of various sorts can do many wonderful things. They can remain submerged for six or eight hours, and the crew will come out no worse for the performance. They can sink rapidly, and keep an even keel under water by an ingenious system of balanced rudders. They can drop to a depth sufficient for them to go under any keel. They can disappear under the water and emerge half a mile distant. The inquiry naturally is whether this is not enough, and why there is not an instant rush to build such boats. The reply is that what is needed is combined performances of this sort, each of which can be a little less remarkable than when used separately. A speed of twelve knots on the surface is excellent, but not so valuable as one of six knots under the water. Submerging for eight hours at rest is noticeable, but submerging for one hour is more so, provided during that hour the boat can be kept going. The difficulties of powerful enough storage batteries where electricity is employed, and the intolerable heat generated where steam is used in running under water—this last, of course, re-

quiring stored steam—are well known. A boat that will go under the water, without once showing itself, for a specified distance (which distance need only be such that it could not have been detected by an enemy when it went below the surface) will be a great success, whatever its speed or slowness as a surface boat. It is a matter of minor consequence even in what time it accomplishes this distance wholly beneath the water.

The most interesting foreign submarine boats at the present time are the new ones on which France and Spain have been recently experimenting. According to *Le Temps* the trials of the *Gymnote*, at Toulon, were very satisfactory. She is said to be of about 30 tons displacement, and to steer exceedingly well, maintaining any desired depth without difficulty. She is operated by electricity, and at full power has a speed of from 9 to 10 knots, this presumably being on the surface. The Spanish submarine boat *Peral* has also attracted much attention. She is 72 feet long by nearly 9½ feet broad, and 87 tons displacement. She is fitted with electromotors and is said to attain a speed of 11 knots on the surface, and not much less below. She has recently been launched, but has not been tried. Commander Peral is confident she could remain submerged more than a day before the air would need to be renewed. She is to carry Whitehead torpedoes.

It is admitted that all submarine torpedo-boats yet tried have fallen short of what is desired, and the proposals made by the Columbia Iron Works are upon the whole more promising than any. A guarantee of 9 knots submerged, with a sub-surface endurance for an hour while thus running, is more than could have been hoped for by the most eager advocate of submarine boats. If she can literally fulfill this our Government will have the start of the rest of the world in this important branch of naval warfare.

We have received the annual report of the secretary and treasurer of the Brown & Sharpe Mutual Relief Association, which was organized for the mutual relief of its members in case of sickness or other infirmity unfitting them for daily labor. The membership is divided into two classes: the first consisting of those whose weekly pay is \$8 or over, and the second of those whose pay is less than \$8 per week. Any person in the employ of the Brown & Sharpe Mfg. Co. is eligible for membership. Admission to the first class is 50 cents, and to the second 25 cents. The dues in the first are 5 cents per week, and in the second 2½ cents, collected every four weeks. In January, 1888, the membership was 253, and during the year 147 entered and 93 left the association. There are 267 belonging to the first class and 40 to the second. During the year 29 assessments were made, and 668 day benefits paid, of which 562 were for sickness and 106 for other causes. The treasurer had on hand, at the beginning of the year, \$156, and received during the year \$715. The expenses amounted to \$616 for sickness and \$19 for all other expenses. The balance on hand January 1, 1889, was \$242.

During the week ending February 23 the Scranton Steel Company, at Scranton, Pa., made in 760 heats 4536 ingots, weighing in the aggregate 5025 tons 11 cwt., the best day's work being 892 tons. In the same week the mill turned out 4243 gross tons of rails.

A. E. Hunt, of Pittsburgh, is manufacturing aluminium on a large scale by a process invented by himself. A sample of the metal in a large ingot was shown at the recent meeting of the American Institute of Mining Engineers.

Wright's Patent Self-Lubricating Axle.

This axle is manufactured by the Buffalo Patent Axle and Wheel Company, Buffalo, N. Y. It is shown in the accompanying illustrations, Fig. 1 representing one end of the axle provided with a hub, Fig. 2 showing the operation of the axle with patented parts, and Fig. 3 showing the back part of the axle. In Figs. 2 and 3 the different parts are denoted by the following letters: A, axle; B, axle bear-

also of the steel parts of the axle, is of special quality, no expense having been spared in the material or finish of the goods. They also claim that the axles are especially durable, and that even with the self-lubricating feature and the other advantages possessed they are offered at about the price of the ordinary axle.

George Gunton, the author of "Wealth and Progress," delivered a striking lecture in Union Hall, Boston, a few nights ago, on "The Economic Relation of Labor to

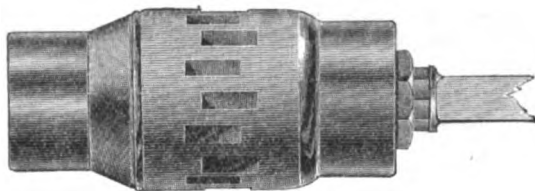


Fig. 1.—One End of a Vehicle Axle Provided With a Hub.

ing; B', fixed collar; C, flanged collar; D, movable flange; E, swivel nut; F, axle box; G, oil chamber; H, nut; I, inside hub band; J, hub; K, outside hub band; L, mortise. The nut H on the front end of the axle has four different uses—namely, it aids in setting the box, serves as an oil chamber, contains absorbent for evenly supplying the oil, and at the same time has the appearance of the ordinary hub, except that it is entirely free from

Capital in Modern Times." In the course of it he pointed out the tendency of an increased diversity of manufacturing interests to bring the capitalist and laborer nearer together. "With the growth of the factory system was inaugurated a new system and a new epoch, upon the threshold of which we now stand. Adam Smith, with his doctrine that profits were the object of labor, and that high profits grow out of low wages, had been the high

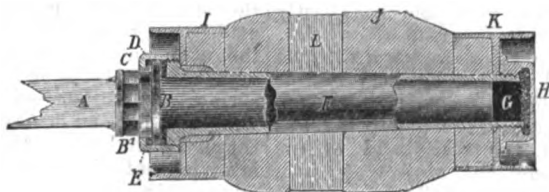


Fig. 2.—Showing Operation of Axle With Patented Parts.

oil on the outside. The manufacturers call special attention to the lubrication, and allude to it as practical and successful under the severe tests to which it has been exposed. The ease and rapidity with which the oil is applied is mentioned, and they guarantee that there will be no setting of the wheel if properly oiled four times a year. The point is also made that the axle is strongest where others are weakest, and that they are proof against breakage in ordinary use. Other points made in regard to it are: That the axle-

priest of the old epoch. Time was when a few aristocrats in one country or another consumed all which capital could produce. But, with machinery and all improvements, those few, that small and privileged class, can no longer begin to consume all which capital is eager to produce. The middle and lower classes now stand ready to be the consumers, and whatever raises their standard of living, be it fair wages or short hours, makes of them a tremendous factor in the success of the capitalist. Help the laborer up! Enable him to buy

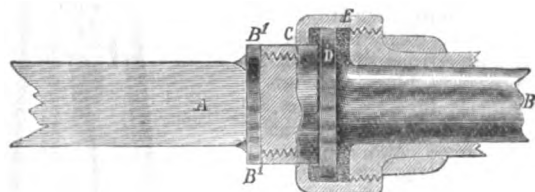


Fig. 3.—Showing Back Part of Axle.

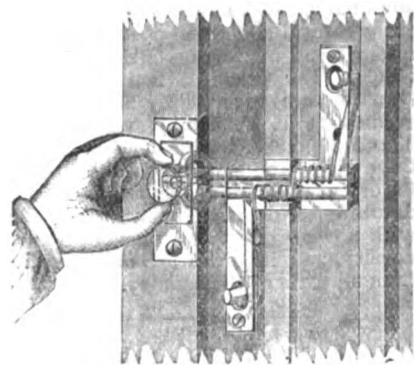
box is very simply set, and requires no banding of the hub, except those bands furnished free with the axle, nor wedging of the box; that owing to the packing of the box in the rear and the perfectly sealed front sand or grit cannot get in or oil work out, and that as the collar of the axle is provided with washers on both sides the wheel is noiseless; that the box being made of malleable iron, case hardened and smaller, affords greater depth for the spoke without increasing the diameter of the hub; that this self-lubricating axle is adapted to fine carriage work, while it is also suitable for heavy wagons, and that the malleable iron used for the boxes, as

your manufactured goods. Give him civilization, self-respect, fair wages. Do not crush him with too long hours. The result will flow into your own coffers in the end, O capitalist! Kill not the goose that lays the golden eggs. Preserve the laborer's well-being as the most valuable, the absolutely indispensable factor of your own success."

California carriers of fruit and vegetables are practically shut out from the Eastern market by increased freight charges amounting to \$20 per car. The shipments by sail last year approximated 500,000 cases.

Timby's Burglar-Proof Sash-Lock and Ventilator.

Messrs. Jenkins & Timby, of Oswego, N. Y., and 102 Chambers street, New York, are introducing to the trade what they are pleased to call Timby's Burglar-



Timby's Burglar-Proof Sash-Lock and Ventilator.—Fig. 1.—Section of Window Frame, Showing Application of Lock.

Proof Sash-Lock and Ventilator, a general idea of the construction and operation of which may be gathered from an inspection of the accompanying illustrations. Fig. 1 shows a section of the window frame with the lock applied, the cut being semi-transparent for the purpose of showing the interior construction, actuating spring, &c. Fig. 2 shows the device with

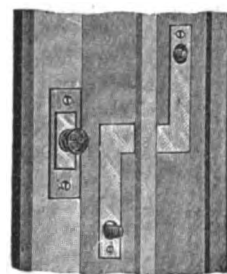


Fig. 2.—Section Showing Thumb-Nut Moved Upward, Releasing Upper Sash.

the thumb-nut moved upward in a position to release the upper sash. Fig. 3 is a back view of the lock and operating device, the thumb-nut being moved upward and the bolts thrown back, the same as in Fig. 2. The bolts employed in this device are made from the best malleable iron, the case is of wrought steel, while the face-plate and thumb-nuts are made of

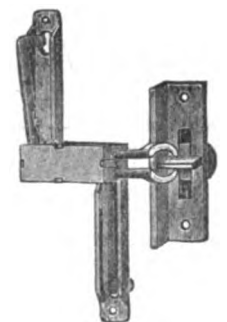


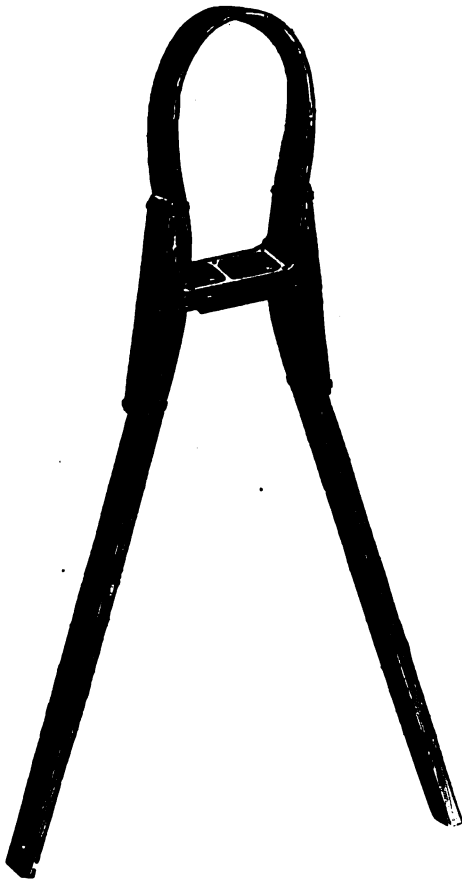
Fig. 3.—Back View of Lock and Operating Device.

brass and bronze metal highly polished and lacquered. The manufacturers state that this lock is very simple in construction and operation, and is readily adapted to any window. One lock is employed to fasten either one or both sash, as may be

desired, securing them in any position, whether the windows are entirely closed or are adjusted for purposes of ventilation. The device is said to automatically secure the sash in place, and the lock is applied in such a manner as to be burglar-proof. It is said that varying thicknesses of sash or inside strips do not interfere at all with its application. It may be used on windows having sash adjusted with or without weights, and does not obstruct the employment of weather-strips or inside blinds. The principal features of construction are covered by letters patent granted to T. F. Timby, under date of March 29, 1887. This lock is made in three sizes, the smallest being designed for ordinary windows, and especially for dumb-waiter doors. The firm are meeting with a very gratifying demand for this novelty, and inquiries are daily received from all parts of the country.

The I X L Poke.

This article is made by A. W. Bishop, Berea, Ohio. The special feature in this poke is the fact that the head, or cross-

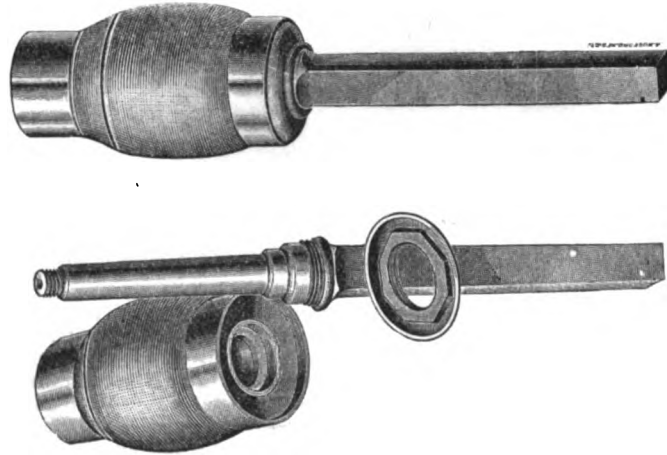


The I X L Poke.

piece, is hinged on one side, being attached to the other by a bolt or catch operated by a spring. With this construction it can be brought up near the animal's neck and avoid the difficulties which have been found when it, as in other pokes, is placed too far down, and especially the liability of the animal to get his front feet through and be cast. As will be inferred from the illustration, the head is so constructed that, when pressed upon, the pins, covered in ordinary use, project and pierce the skin of the unruly beast. In order to preclude the possibility of their breaking, it is stated that the best of oak or hickory timber will be used. The effectiveness of this contrivance in preventing mules or horses from pushing or jumping fences, or being injured by barb wire, is alluded to.

The Wentworth Dust Guard Axle.

This axle, the construction of which is represented in the accompanying illustrations, is made by the Wentworth Spring and Axle Company, Gardiner, Me. It is intended to meet the demand for an efficient, easily applied and strong contrivance for keeping dust and grit from the axles of carriages, while it will also prevent the sticking of wheels, the waste of oil or grease used in lubricating and the



Wentworth's Dust Guard Axle.

untidy appearance of the axle stock caused by the escaping oil. As will be seen from the illustrations, the flange of the guard, which is made of malleable iron neatly finished, is made to fit a hub of any size, and is attached to the shoulder of the axle by a right and left hand thread and is turned to its place by a light wrench furnished for the purpose. The box is set as for other axles, the rear band of the hub being made to project $\frac{1}{4}$ inch over the wood. The following points are made in regard to the advantages of this axle: That it is especially strong, being of full size of iron or steel where the strength is needed; that it protects the axle arms from water, dirt or grit; that with ordinary care it will never stick; that no oil is permitted to outwork upon the axle stock and hub; that, as the oil is retained and kept clean, less frequent oiling is required; and that it is simple, strong and especially durable.

Grasse, in the South of France, is the headquarters for the manufacture of perfumes, though Nice and Cannes are close rivals. Grasse and Cannes excel in the culture of the rose, cassie, jasmine and tuberose. Nice is celebrated for its violet and mignonette, while Sicily furnishes most of the orange and citron. In Grasse 22,000 pounds of orange blossoms were received at the factories in a single day, and the value of the flowers consumed at the three points named approximates \$1,000,000 yearly. From 120,000 to 150,000 pounds of pomade are imported each year for use in the processes of manufacture, packing, &c.

Commendation from a high source was bestowed upon American workmen by Lord Brassey, of England, in a paper read by him on the 22d inst. before the United Service Institution. In reference to the building yards of America he said: "No navy has displayed more original genius in construction than that of the United States." The lecturer then proceeded to compare English and French dockyards, stating that in French dockyards the number of workmen is 21,000, and their average earnings £40 a year. The number of workmen in English dockyards is 18,047, and their average earnings exceed £65 a year. With this remarkable difference in

the scale of wages, the cost of building appears to be approximately the same in the two countries.

New Combination Divider No. 85.

This tool is made by L. S. Starrett, Athol, Mass. The cut represents it with its attachments. It has, it will be observed, auxiliary caliper legs which, together with a common pencil, may all be used interchangeably with the arms, forming valuable

combinations. A novel feature in this divider is an auxiliary nut between the arms to lock them firmly against the action of the spring after the fine adjustment is made, thus remedying the weak point in the common wing-divider, the legs of which are only as stiff as the adjusting spring. It will be observed also that the wing is round and is fastened by passing through a stud set in the arm, upon which is a wing-nut with full thread to clamp the wing firmly. This is referred to as more efficient and durable than the common kind with the screw tapped upon the arm only three or four threads deep, which soon wears out. The head and arms are made from malleable iron, the rest of steel. The points are hardened and warranted first



New Combination Divider No. 85.

class. The smallest size is 7 inches long, which by adjustments of points becomes 9 inches, and will describe a 22-inch circle. It will caliper 11 inches outside and 13 inches inside. The second size is 9 inches and by adjustments of points becomes 12 inches, and will describe a 30-inch circle, and caliper 14 inches outside and 16 inches inside. The divider will be sold without caliper legs when so ordered.

CURRENT HARDWARE PRICES.

FEBRUARY 27, 1889.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers' name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers, at the figures named.

Ammunition.—

Caps, Percussion, 1000—	
Hicks & Goldmark's	
F. L. Waterproof, 1-10's	50¢
E. B. Trimmings Edge, 1-10's	25¢
E. B. Grnd. Edge, Cent. Fire, 25 & 1-10's	75¢
Double Waterproof, 1-10's	\$1.40
Musket Waterproof, 1-10's	50¢
G. D.	25¢
S. B.	30¢
Union Metallic Cartridge Co.	
F. C. Trimmings	50¢
F. L. Ground	25¢
Cent. Fire Ground	75¢
Dbl. Waterproof	\$1.40
Dbl. Waterproof, in 1-10's	75¢
S. B. Genuine Imp. ortd.	45¢
Eley's E. B.	54¢
Eley's D Waterproof, Central Fire	\$1.50

Cartridges.	
Rim Fire Cartridges	50¢
Rim Fire Mfg. Co.	50¢
Cent. Fire, Pistol and Rifle	25¢
Cent. Fire, Military and Sporting	15¢
Blank Cartridges, except 22 and 32 cal., additional 10% on above discounts.	
Blank Cartridges, 32 cal., \$1.75	2¢
Blank Cartridges, 32 cal., \$3.50	2¢
Primed Shells and Bullets	15¢
B. B. Caps, Round Ball, \$1.75	2¢
B. B. Caps, Con. Ball, Swgd., \$2.00	2¢

Primers—	
Berdan Primers, \$1.00	2¢
B. L. Caps (for Sturtevant Shells) \$1.00	2¢
All other Primers, \$1.20	2¢

Shells—	
First quality, 4, 8, 10 and 12 gauge	25¢
First quality, 14, 16 and 20 gauge (\$10 list)	25¢
Star, Club, Rival and Climax brands, 10 and 12 gauge	35¢
Star, Club, Rival and Climax brands, 14, 16 and 20 gauge	30¢
Seibold's Comb. Shot Shells	15¢
Brass Shot Shells, 1st quality	60¢
Brass Shot Shells, Club, Rival, Climax	65¢
I. X. L. 10 and 12 gauge	40¢
"Special," 16 gauge	30¢
"Special," 10 and 12 gauge	40¢
Fowler's Pat.	\$3.25

Shells Loaded—	
A. M. Co. List No. 19, 1887	20¢
Wads—	
U. M. C. & W. R. A.—B. E., 11 up	\$2.00
U. M. C. & W. R. A.—B. E., 9, 10, 11	2.30
U. M. C. & W. R. A.—B. E., 7, 8, 9	2.60
U. M. C. & W. R. A.—P. E., 11 up	3.10
U. M. C. & W. R. A.—P. E., 9, 10, 11	3.40
U. M. C. & W. R. A.—P. E., 7, 8, 9	3.70
Eley's E. B., 11 up	\$1.75
Eley's P. E., 11 up	2.80

Anvils—	
Eagle Anvil, 10 & 14	20¢
Peter Wright's	9¢
Armstrong's Mouse Hole	8¢
Armstrong's Mouse Hole, Extra 11	11¢
Trenton	9¢
Widomson's	9¢
J. & Riley Carr, Pat. Cold	11¢
Moore & Barnes Mfg. Co.	35¢

Anvil Vises and Drills—	
Miller's Pat. Co.	20¢
Cheney Anvil and Vise	25¢
Allen Anvil and Vise	\$5.00, dis 40¢

Apple Parers—	
Advance	\$4.75
Antrim Combination	5.50
Baldwin	5.25
Champion	7.25
Eureka, 1888	17.00
Family Bay State	12.00
Gem	5.25
Gold Medal	4.00
Hudson's New '88	3.75
Ideal	4.75
Improved Bay State	30.00
Little Star	5.00
Monarch	13.50
New Lightning	5.50
Orion	4.00
Perfection	4.00
Pomona	4.00
Rocking Table	6.00
Turntable	4.50
Victor	13.50
Waverly	4.50
White Mountain	4.00
72	4.25
76	4.50
78	4.50

Augers and Bits—	
Douglas Mfg. Co.	
Wm. A. Ives & Co.	70¢
Humphreysville Mfg. Co.	
French, Swift & Co. (F. H. Beecher)	
Cook's, Douglas Mfg. Co.	55¢
Cook's, N. H. Copper Co.	50¢
Free Circular Lip	30¢
Patent Solid Head	30¢
C. E. Jennings & Co., No. 10, extension	40¢
Up	40¢
C. E. Jennings & Co., No. 30	60¢
C. E. Jennings & Co., Auger Bits, 1/2 set, 3/4, 1, 1 1/4, 2, 3, 4, 5, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100	20¢
Lowell Patent Single Twist	45¢
Jennings' Augers and Bits	25¢
Imitation Jennings' Bits	60¢
Push's Black	90¢
Car Bits	50¢
L. McDonough Car Bits	10¢
Forster Pat. Aug. Bits	10¢

Hollow Augers—

Ives' No. 4, 7 dos \$60	25¢
French, Swift & Co.	25¢
Douglas	25¢
Bonney's Adjustable, 7 dos \$48	40¢
Stearns	30¢
Ives' Expansive, each \$4.50	50¢
Universal Expansive, each \$4.50	50¢
Wood's	25¢

Expansive Bits—

Clarks' small, \$18; large, \$26	35¢
Ives' No. 4, 7 dos \$60	25¢
Swan's	40¢
Stearns, No. 1, \$28; No. 2, \$22	35¢
Stearns' No. 2, \$48	20¢

Gimlet Bits—

Common	\$2.75
Diamond	\$1.10
"Bee"	25¢
Double Cut, Shepardson's	45¢
Double Cut, Ct. Valley Mfg. Co.	30¢
Double Cut, Hartwell's, 7 gro.	\$2.25
Double Cut, Douglas	40¢
Double Cut, Ives	60¢

Bit Drill—

Morse Twist Drills	50¢
Standard	50¢
Cleveland	50¢
Syracuse, for metal	50¢
Syracuse, for wood (wood list)	30¢
Williams' or Holt's, for metal	50¢
Williams' or Holt's, for wood	40¢

Ship Augers and Bits—

L'Hommedieu's	15¢
Watrous	15¢
Snell's	15¢
Snell's Ship Auger Pat'n Car Bits	15¢

Awl Hfts—

Sewing, Brass For	\$3.50
Pat. Sewing, Short	\$1.00
Pat. Sewing, Long	\$1.20
Pat. Peg, Plain Top	\$10.00
Pat. Peg, Leather Top	\$12.00

Awls, Brad Sets, &c—

Awls, Sewing, Common	\$1.70
Awls, Should. Peg	\$2.45
Awls, Pat. Peg	65¢
Awls, Shouldered Brad, 2 7/8 gr.	\$4.50
Awls, Handled Brad	\$7.50
Awls, Handled Scratch	\$7.50
Awls, Socket Scratch	\$1.50

Awl and Teel Sets—

Alken's Sets, Awls and Tools	
No. 20, 7 dos \$10.00	55¢
Pray's Adj. Tool Hds., Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100	\$1.15
Miller's Falls Adj. Tool Hds.	\$5.00
No. 1, \$12; 2, \$18	25¢
Henry's Combination Hft.	25¢
Brad Sets	
No. 42, \$10.50; No. 43, \$12.50	70¢
Stanley's Excelsior	
No. 1, \$7.50; No. 2, \$4.00; No. 3, \$5.50	30¢

Axes—

Makers' and Special Brands—	
First quality	\$5.00
Others	\$5.50

Axle Grease—

Fraser's	Keg 7 & 4, Pail 7 & 4
Fraser's, in boxes	\$7.50
Dixon's Everlasting, in bxs.	\$1.20
Dixon's Everlasting, 10-lb pails, ea. 8¢	\$7.00
Lower grades, special brands	\$7.00

Axles—

No. 1	4¢
Nos. 7 to 14	5¢
Nos. 15 to 18	47¢
Nos. 19 to 23	70¢
National Tubular Self-Oiling Standard	
Farm (1 to 5) and Special Farm (A1 to A5)	
Less than 10 sets	33¢
Over 10 sets	33¢

Bag Holders—

Sprengle's Pat.	\$18.00
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Balances—

Spring Balances	50¢
Common 24-lb	\$1.50
Challion's Spring Balance	80¢
Challion's Circular Spring Balances	90¢

Bells—

Hand—	
Light Brass	70¢
Extra Heavy	60¢
White Metal	60¢
Silver Chime	33¢
Globe (Cone's Patent)	25¢

Door—

Gong, Abbe's	33¢
Gong, Yankee	15¢
Gong, Barton's	40¢
Crank, Taylor's	25¢
Crank, Brooks	50¢
Crank, Cone's	10¢

Crank, Connel's	20¢
Lever, Sargent's	60¢
Lever, Taylor's Bronzed or Plated	25¢
Lever, Taylor's Japanned	25¢
Lever, B. E. M. Co.'s	50¢
Pull, Brook's	50¢
Pull, Western	25¢

Common—

Common Wrought	60¢
Western, Sargent's list	70¢
Kentucky, "Star"	30¢
Kentucky, Sargent's list	70¢
Dodge, Genuine Kentucky	70¢
Texas Star	50¢
Call	40¢
Farm Bells	\$3.00
Steel Alloy Church and School Bells	40¢

Bellows—

Blacksmiths'	50¢
Molders'	40¢
Hand Bellows	40¢

Belting, Rubber—

Common Standard	70¢
Extra	70¢
N. Y. B. & P. Co., Carbon	60¢
N. Y. B. & P. Co., Diamond	60¢

Bench Steps—

Morrill's	\$5.00
Hotchkiss's	\$5.00
Weston's, No. 1, \$10; No. 2, \$2.25	10¢
McGill's	\$5.00

Bits—

Auger, Gimlet, Bit Stock, Drills, &c.	
see Augers and Bits.	

Bit Holders—

Extension, Barber's	\$15.00
Extension, Ives	\$20.00
Diagonal	\$24.00
Angular	\$24.00

Blind Adjusters—

Domestic	\$3.00
Excelsior	\$10.00
Washburn's Self-Locking	\$20.00

Blind Fasteners—

Mackrell's	\$1.00
Van Sand's Screw Pat.	\$15.00
Van Sand's Old Pat.	\$15.00
Washburn's Old Pattern	\$5.00
Merriman's	\$5.00
Austin & Eddy No. 2008	\$2.00
Security Gravity	\$2.00

Blind Staples—

Barbed, 1/4 in. and larger	\$7.00
Barbed, 3/4 in.	\$12.00

Blocks—

Cleveland Block Co., Mal. Iron	50¢
Moore's Novelty, Mal. Iron	50¢

Belts—

Door and Shutter—	
Cast Iron Barrel Square, &c.	70¢
Cast Iron Shutter Bolts	70¢
Cast Iron Chain (Sargent's list)	55¢
Ives' Patent Door Bolts	60¢
Wrought Barrel	70¢
Wrought Square	70¢
Wrt. Shutter, all Iron, Stanley's	60¢
Wrt. Shutter, Brass Knob	40¢
Wrt. Shutter, Sargent's list	60¢
Wrt. Sunk Flush, Sargent's list	55¢
Wrt. Sunk Flush, Stanley's list	50¢
Wrt. B.K. Flush, Com'n	55¢

Carriage Machine, &c—

Com. Hist June 10, '84	75¢
Genuine Eagle, list Oct. '84	75¢
Phila. pattern, list Oct. 7, '84	75¢
R.B. & W., old list	70¢
Machine, according to size	75¢
Bolt Ends, according to size	75¢

Tire—

Common, list Feb. 28, '88	70¢
P.C. & N. Co.	
Empire, list Feb. 28, '88	70¢
Phila., list Oct. '84	82¢
Keystone, Philadel., list Oct. '84	80¢
Norway, Phila., list Oct. '84	75¢
Norway, Phil., list Oct. 16, '84	75¢
Eagle, Phil., list Oct. 16, '84	80¢
Phila., list Oct. 16, '84	82¢
Bay State, list Feb. 28, '88	70¢
R.B. & W., Philadel., list Oct. 16, '84	82¢
R. & E. Mfg. Co.	70¢

Stove and Flow—

Stove	62¢
Flow	62¢
Am. & Co. Stove, Annealed	62¢
R. B. & W. Stove	62¢
R. B. & W. Stove	62¢
R. & E. Mfg. Co., Stove	62¢

Borax—

Borax	\$9.00
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Boring Machines—

Without Augers.	
Douglas	\$5.50
Snell's, Rice's Pat.	5.50
Jennings	5.50
Other Machines	2.35
Phillips' Patent	7.00
with Augers	7.50

Bow Pins—

Humason, Beckley & Co.'s	60¢
Sargent & Co.'s	\$17 and \$18
Peck, Stow & W. Co.	60¢

Braces—

Barber's	
Nos. 10 to 16	50¢
Nos. 30 to 33	50¢
Nos. 40 to 63	50¢
Barker's	
Nos. 8, 10 and 12	75¢
Plated, Nos. 8, 10 and 12	65¢
Osgood's Ratchet	40¢
Spofford's	50¢

Cards—	
Horse & Curry.....	10&10&10&10&10
Cotton.....	New list, Aug., 1888, 10&10&10
Wool.....	New list, Aug., 1888, 10&10&10
Carpet Stretchers—	
Cast Steel, Polished.....	doz \$2.25
Cast Iron, Steel Points.....	doz 80¢
Socket.....	doz \$1.75
Bullard's.....	25¢/25¢/10¢
Carpet Sweepers—	
Bissell No. 5.....	doz \$17.00
Bissell No. 7 New Drop Pan.....	doz \$19.00
Bissell, Grand.....	doz \$36.00
Grand Rapids.....	doz \$24.00
Crown Jewel, No. 1.....	\$19.00; No. 2, doz \$17.00
Magie.....	doz \$15.00
Jewel.....	doz \$17.00
Improved Parlor Queen, Nickel.....	doz \$27.00
Improved Parlor Queen, Japan.....	doz \$24.00
Excelsior.....	doz \$22.00
Garland.....	doz \$18.00
Parlor Queen.....	doz \$24.00
Housewife's Delight.....	doz \$15.00
Queen.....	doz \$16.00
Queen, with band.....	doz \$18.00
King.....	doz \$30.00
Weed, Improved.....	doz \$18.00
Hub.....	doz \$16.00
Cog-Wheel.....	doz \$16.00
Conqueror.....	doz \$22.00
Easy.....	doz \$22.00
Monarch.....	doz \$22.00
Goshen.....	doz \$21.00
Advance.....	doz \$18.00
Ladies' Friend, No. 1.....	doz \$15.00
No. 2.....	doz \$16.00
American.....	doz \$15.00
Grand Republic.....	doz \$35.00
Cartridges—	
See Ammunition.	
Casters—	
Bed.....	New list:
Plate.....	Brass.....55¢/55¢/5¢
Shallow Socket.....	Others.....40¢/10¢
Deep Socket.....	40¢/10¢
Yale Casters, list May, 1884.....	30¢/10¢/40¢
Yale, Gem.....	60¢/60¢/5¢
Martin's Patent (Phoenix).....	45¢/10¢/50¢
Payson's Anti-friction.....	60¢/60¢/10¢
Giant Truck Casters.....	30¢
Stationary Truck Casters.....	50¢/10¢
Socket Truck Casters.....	50¢
Cattle Leaders—	
Humason, Beckley & Co.'s.....	70¢
Sargent's.....	60¢/10¢
Hotchkiss.....	30¢
Peck, Stow & W. Co.....	50¢/10¢
Chain—	
Trace, 6½-10-2, exact.....	50¢/10¢/50¢/10¢/5¢
Trace, 6½-10-3, exact.....	50¢/10¢/50¢/10¢/5¢
Trace, 6½-10-4, exact.....	50¢/10¢/50¢/10¢/5¢
Trace, 7-10-2, exact.....	50¢/10¢/50¢/10¢/5¢
Trace, 7-10-3, exact.....	50¢/10¢/50¢/10¢/5¢
Trace, 7-10-4, exact.....	50¢/10¢/50¢/10¢/5¢
NOTE.—Traces, "Regular" sizes, 3¢ net pair less than exact.	
Log, Fifth, Stretcher, and other fancy Chains, list Nov. 1, 1888.....	50¢/10¢/50¢/10¢/5¢
Chain—	
American Coil, in cask lots.....	3-16 ¼ 5-16 ¾ 7-16 ¾ 9-16 ¾ 1-16 ¾
\$8.75 6.25 5.00 4.50 4.00 3.75 3.50	
Less than cask lots, add ¼¢ per lb.	
German Coil, list of June 20, 1887.....	50¢/10¢/50¢/10¢/5¢
German Halter Chain, list of June 20, 1887.....	50¢/10¢/50¢/10¢/5¢
Covert Halter, Hitching and Breast.....	35¢/2¢
Covert Traces.....	35¢/2¢
Oneida Halter Chain.....	60¢/60¢/5¢
Galvanized Pump Chain.....	5¢/10¢/6¢
Jack Chain, Iron.....	75¢/75¢/5¢
Jack Chain, Brass.....	70¢/70¢/5¢
Chalk—	
White.....	gr 50¢
Red.....	gr 70¢
Blue.....	gr 80¢
White Crayons, gr 12¢/12¢/12¢.....	10¢
Chalk Lines—	
See Lines.	
Chisels—	
Socket Framing and Firmer.	
P. S. & W.....	75¢/5¢/75¢/10¢
New Haven.....	75¢/5¢/75¢/10¢
Wetherby.....	75¢/5¢/75¢/10¢
Mix.....	75¢/5¢/75¢/10¢
Ohio Tool Co.....	75¢/5¢/75¢/10¢
Douglas.....	75¢/5¢/75¢/10¢
Buck Bros.....	75¢/5¢/75¢/10¢
Merrill.....	60¢/10¢/60¢/10¢/5¢
L. & I. J. White.....	30¢/30¢/5¢
Tanged and Miscellaneous.	
Tanged Firmer.....	40¢/10¢
Butcher's.....	\$4.75 to \$5.00
Spear & Jackson's.....	\$5 to \$5
Buck Bros.....	30¢
Cold Chisels, gr 10¢.....	10¢/10¢
Chucks—	
Beach Pat.....	each, \$8.00.....20¢
Morse's Adjustable, each, \$7.00, dis 20¢/20¢/5¢	
Danbury.....	each, \$8.00, dis 30¢/30¢/5¢
Syracuse, Balz Pat.....	25¢
Clamps—	
Providence Tool Co.'s Wrought Iron.....	25¢
Adjustable, Gray's.....	30¢
Adjustable, Lambert's.....	20¢
Adjustable, Snow's.....	40¢/5¢
Adjustable, Hammers.....	15¢
Adjustable, Stearn's.....	30¢/10¢
Stearn's Adjustable Cabinet and Cor- ner.....	20¢/10¢
Cabinet, Sargent's.....	60¢/10¢
Carriage Makers', Sargent's.....	70¢/10¢
Eberhard Mfg. Co.....	40¢/5¢/40¢/10¢
Warner's.....	40¢/10¢/40¢/10¢/5¢
Saw Clamps, see Vises	
Clips—	
Norway, Axle, ¼ & 5-16.....	55¢/5¢/5¢
2nd grade Norway Axle, ¼ & 5-16.....	65¢/5¢
Superior Axle Clips.....	60¢/5¢/60¢/5¢/5¢

Norway Spring Bar Clips, 5-16, 60&5&5¢	
Wrought-Iron Felloe Clips.....	doz 5½¢
Steel Felloe Clips.....	doz 5¢
Baker Axle Clips.....	25¢
Cockeyes.....50¢	
Cocks, Brass.	
Hardware list.....	40. & 10&2¢
Coffee Mills—	
Box and Side, List revised Jan. 1, 1888.....	50&2¢
American, Enterprise Mfg. Co. 20&10&30¢	
The "Swift," Lane Bros.....	20&10¢
Compasses, Dividers, &c—	
Compasses, Calipers, Dividers, 70&70&10¢	
Bemis & Call Co.'s Dividers.....	60&5¢
Bemis & Call Co.'s Compasses & Cali- pers.....	50&5¢
Bemis & Call Co.'s Wing & Inside or Outside.....	50&5¢
Bemis & Call Co.'s Double.....	60¢
Bemis & Call Co.'s (Call's Pat. Inside). 30¢	
Excelsior.....	50¢
J. Stevens & Co.'s Calipers and Dividers.....	25&10¢
Starrett's Spring Calipers and Dividers.....	25&10¢/10¢
Starrett's Lock Calipers and Dividers.....	25&10¢
Starrett's Combination Dividers.....	25&10¢
Coopers' Tools—	
Bradley's.....	20¢
Barton's.....	20¢/20¢/5¢
L. & I. J. White.....	20¢/5¢
Albertson Mfg. Co.....	25¢
Beatty's.....	40¢/40¢/5¢
Sandusky Tool Co.....	30¢/30¢/5¢
Corkscrews—	
Humason & Beckley Mfg. Co. 40&40&10¢	
Clough's Pat.....	33½¢/33½¢/5¢
Howe Bros & Hulbert.....	35¢
Cork Knives and Cutters—	
Bradley's.....	10¢
Wadsworth's.....	25¢
Cradles—	
Grain.....	50&2¢
Crow Bars—	
Cast Steel.....	doz 4¢
Iron, Steel Points.....	doz 3½¢
Curry Combs—	
Fitch's.....	50&10¢/50&10¢/10¢
Rubberper doz \$10.00.....	20¢
Perfect.....	50¢
Curtain Pins—	
Silvered Glass.....	net
White Enamel.....	net
Cutlery—	
Beaver Falls & Booth's.....	33½¢
Wostenholme.....	\$7.75 to \$2
Dampers, &c—	
Dampers, Buffalo.....	50¢
Buffalo Damper Clips.....	50¢
Crown Damper.....	40¢
Excelsior.....	40&10¢
Dividers—	
See Compasses.	
Dog Collars—	
Embossed, Gift, Pope & Steven's list.....	30&10¢
Leather, Pope & Steven's list.....	30&10¢
Brass, Pope & Steven's list.....	40¢
Door Springs—	
Torrey's Rod, regular size.....	doz \$1.30
Gray's, gr.....	20¢
Bee Rod, gr.....	20¢
Warner's No. 1, gr.....	\$2.50; No. 2, \$3.30.....40&10¢/50¢
Gem (Coll), list April 19, 1886.....	10¢
Star (Coll), list April 19, 1886.....	20¢
Victor (Coll).....	60¢/60¢/10¢
Champion (Coll).....	60&10¢/60&10¢/10¢
Philadelphia, 6 in., \$5.00; 8 in., \$7.75.....	35¢
Cowell's.....	No. 1, gr doz, \$18.00; No. 2, \$15.00.....50¢
Rubber, complete, gr doz, \$4.50.....	55¢/10¢
Hercules.....	50¢
Shaw Door Check and Spring.....	25¢/30¢/35¢
Drawing Knives—	
Wetherby.....	25¢
P. S. & W.....	75¢/5¢
Mix.....	75¢/10¢
New Haven.....	60&10¢/60&10¢/5¢
Merrill.....	60&10¢/60&10¢/5¢
Douglas.....	75¢/75¢/5¢
Watrous.....	15¢/10¢/25¢
L. & I. J. White.....	20¢/5¢
Bradley's.....	35¢
Adjustable Handle.....	25¢/25¢/5¢
Wilkinson's Folding.....	25¢/25¢/5¢
Drills and Drill Stocks—	
Blacksmith's.....	each \$1.75
Blacksmith's Self-Feeding, each \$7.50.....	30¢
Breast, P. S. & W.....	40&10¢
Breast, Wilson's.....	30&5¢
Breast, Millers Falls.....	each \$3.00, dis 25¢
Breast, Bartholomew's.....	each \$2.50, dis 25&10¢/40¢
Ratchet, Merrill's.....	20¢/20¢/5¢
Ratchet, Ingersoll's.....	20¢/20¢/5¢
Ratchet, Parker's.....	20¢/20¢/5¢
Ratchet, Whitney's.....	20¢/10¢
Ratchet, Weston's.....	20¢/25¢
Ratchet, Moore's Triple Action.....	25¢/30¢
Whitney's Hand Drill, Plain, \$11.00.....	20&10¢
Adjustable, \$12.00.....	20&10¢
Wilson's Drill Stocks.....	10¢
Automatic Boring Tools.....	\$1.75 to \$1.85
Twist Drills—	
Morse.....	50&10¢/5¢
Standard.....	50&10¢/5¢
Syracuse.....	50&10¢/5¢
Cleveland.....	50&10¢/5¢
Williams.....	50&10¢/10¢
Drill Bits.—See Augers and Bits.	

Drill Chucks.—See Chucks.	
Dripping Pans—	
Small sizes.....	doz 6½¢
Large sizes.....	doz 6½¢
Egg Beaters.	
Dover.....	doz \$1.50
National.....	doz \$4.50.....33½¢
Family (T. & S. Mfg. Co.).....	gro \$17.00
Duplex (Standard Co.).....	gro \$15.00
Rival (Standard Co.).....	gro \$12.00
Large Duplex (Standard Co.).....	doz \$4.50
Triumph (T. & S. Mfg. Co.).....	gro \$10.50
Advance, No. 1.....	gro \$10.50
Advance, No. 2.....	gro \$10.00
Bryant's.....	gro \$15.00
Ayres' Spiral.....	gro \$5.00
Double (H. & R. Mfg. Co.).....	gro \$16.30
Easy (H. & R. Mfg. Co.).....	gro \$14.00
Triple (H. & R. Mfg. Co.).....	gro \$16.20
Spiral (H. & R. Mfg. Co.).....	gro \$4.50
Faine, Diehl & Co.'s.....	gro \$24.00
Egg Poachers—	
Buffalo Steam Egg Poachers, gr doz, No. 1, \$6.00; No. 2, \$9.00.....	25¢
Electric Bell Sets.—	
Wollensak's.....	20¢
Bigelow & Dowse.....	20¢
Emery—No. 4 to No. 54 to Flour, CF	
40 gr.....	150 gr.....F F F.
1/2 kegs, gr 4.....	5 2½¢
1/4 kegs, gr 4.....	5½¢
10 lb cans, 10.....	5½¢
10 lb cans, 10.....	5½¢
10 lb cans, less than 10.....	10 7½¢
Enameled and Tinned Ware—	
See Hollow-Ware.	
Escutcheon Pins—	
Iron, list Nov. 11, 1885.....	50&10¢/50&10¢/5¢
Brass.....	60¢/60¢/5¢
Escutcheons.	
Door Lock.....	Same dis as Door Locks.
Brass Thread.....	60¢/60¢/10¢
Wood.....	25¢
Faucets.—	
Fenn's.....	40¢
Bohren's Pat. Rubber Ball.....	25¢
Fenn's Cork Stops.....	33½¢
Star.....	60¢
Frays's Pat. Petroleum.....	40&5&2¢
P. L. E. Co.....	50¢
West's Lock, Open and Shut Key.....	50¢
Star, Metal Plug, new list.....	40¢
Lockport, Metal Plug, reduced list.....	60¢
Metallic Key, Leather Lined.....	60&10¢
Cork Lined.....	60&10¢/10¢
Burnside's Red Cedar.....	70&5¢/70&10¢
Burnside's Red Cedar, bbl lots.....	50¢
John Sommers'.....	50¢
Peerless Best Block Tin Key.....	40¢
IXL, 1st quality, Cork Lined.....	50¢
Diamond Lock.....	40¢
Perfection, Fla. Red Cedar.....	50¢
Goodenough Cedar.....	50¢
Boss Metallic Key.....	50¢
Reliable Cork Lined.....	60¢
Western Pattern Cork Lined.....	50¢
Self-Measuring.....	20&10¢
Enterprise, gr doz \$50.00.....	20&10¢
Lane's, gr doz \$36.00.....	25&10¢
Victor, gr doz \$36.00.....	25&10¢
Felloe Plates.....doz 6¢/6½¢	
Fifth Wheels.—	
Derby and Cincinnati.....	45&5¢
Files—	
Domestic—	
Nicholson Files, Rasps, &c.....	60&10¢/60&10¢
Nicholson (X. F.) Files.....	10&5¢
Nicholson's Royal Files (Seconds).....	25¢
75¢ (extra prices on certain sizes)	
Other makers, best brands.....	60&10¢/60&10¢/10¢
Fair brands.....	60&10¢/60&10¢/70¢
Second quality.....	70&10¢/70&10¢/10¢
Nicholson's Horse Rasps.....	60&10¢/60&10¢
Heller's Horse Rasps.....	50&7½¢/50&10¢
McCaffrey's Horse Rasps.....	50&10¢
Imported—	
J. & Riley Carr.....	list, April 1, 1883, 15¢
J. & Riley Carr Horse Rasps.....	10¢
Moss & Gamble.....	list, April 1, 1883, 15¢
Butcher's list, 20¢	
Stubbs.....	25¢/30¢
Turton's.....	20¢/25¢
Greaves' Horse Rasps.....	American list, 60¢
Fluting Machines—	
Knox, 4½-inch Rolls.....	\$3.25 each 35¢
Knox, 6-inch Rolls.....	\$3.60 each 35¢
Eagle, 3½-inch Roll, \$2.15.....	35¢
Eagle, 5½-inch Roll, \$2.85.....	35¢
Crown, 4½ in., \$3.50; 6 in., \$4.00; 8 in., \$6.50 each.....	35¢
Crown Jewel, 6 in.....	\$3.50 each 35¢
American, 5 in., \$3.00; 6 in., \$3.40; 7 in., \$4.50 each.....	35¢
Domestic Fluter.....	\$1.50 each net
Geneva Hand Fluter, White Metal, gr doz \$12, dis 25¢	
Crown Hand Fluter, Nos. 1, \$15.00; 2, \$12.50; 3, \$10.00.....	20¢
Shepard Hand Fluter, No. 85 gr doz.....	\$15.30
Shepard Hand Fluter, No. 110 gr doz.....	\$11.00
Shepard Hand Fluter, No. 95 gr doz.....	\$8.00
Clark's Hand Fluter, gr doz \$15.00.....	40¢
Combined Fluter and Sad Iron.....	30¢
gr doz \$15.00.....	30¢
Buffalo.....	gr doz \$10.00.....10¢
Fluting Scissors.....45¢	
Fodder Squeezers—	
Blair's.....	gr doz \$2.00
Blair's "Climax".....	gr doz \$1.25

Forks—	
Hay, Manure, &c., Asso. List.....	65¢
Hay, Manure, &c., Phila. List.....	60¢/60¢/5¢
Plated, see Spoons.	
Freezers, Ice Cream—	
Buffalo Champion.....	60&10&5¢
Shepard's Lightning.....	65¢
White Mountain.....	60¢
Fruit and Jelly Presses—	
Enterprise Mfg. Co.....	20&10¢/30¢
Henis.....	doz \$3.75 to \$4.00
P. D. & Co.....	doz \$3.75 to \$4.00
Shepard's Queen City.....	40¢
Fry Pans—	
High List.....	75&5¢/75&10¢
No.....	0 1 2 3 4
doz.....	\$3.75 \$4.70 \$5.30 \$5.95 \$6.55
No.....	5 6 7 8
doz.....	\$7.50 \$8.75 \$10.00 \$11.25
Low List.....	0 1 2 3 4
doz.....	\$3.00 \$3.75 \$4.25 \$4.

Cross-Cut Saw Handles—
Atkins' No. 1 Loop, 30¢; No. 3,
22¢; No. 2 and No. 4 Reversible, 22¢.
Boynton's Loop Saw Handles, 50¢.
Champion, 15¢.

Hangers—
Barn Door, old patterns, 60¢; 10¢; 10¢; 70¢.
Barn Door, New England, 60¢; 10¢; 10¢; 70¢.
Samson Steel Anti-Friction, 55¢.
Orleans Steel, 55¢.
Hamilton Wrought Wood Track, 55¢.
U. S. Wood Track, 55¢.
Champion, 60¢; 10¢.
Rider and Wooster, Medina Mfg. Co.'s
List, 70¢.
Climax Anti-Friction, 60¢.
Climax Anti-Friction for Wood Track, 55¢.
Zenith for Wood Track, 55¢.
Reed's Steel Arm, 50¢.
Challenge, Barn Door, 50¢.
Sterling's Improved (Anti-Friction), 55¢; 10¢.
Victor, No. 1, \$18.00; No. 2, \$18.50; No. 3, \$18.00, 50¢; 25¢.
Cheritree, 50¢; 10¢.
Kidd's, 50¢; 10¢; 60¢.
The Boss, 60¢; 10¢.
Best Anti-Friction, 60¢; 10¢.
Duplex (Wood Track), 60¢; 10¢.
Terry Pat., 5¢; 10¢; 5¢; 10¢; 5¢; 10¢.
Cronk's Pat., No. 4, \$12.00; No. 5, \$14.40.
No. 6, \$18.00, 50¢; 15¢; 60¢.
Wood Track Iron Clad, 5¢; 10¢; 50¢.
Carrier Steel Anti-Friction, 50¢; 50¢; 50¢.
Architect, 5¢; 10¢.
Eclipse, 50¢; 10¢.
Felix, 5¢; 10¢; 50¢.
Richards, 50¢; 10¢; 10¢.
Lane's Steel Anti-Friction, 40¢; 10¢.
Ball Bearing Door Hanger, 30¢; 10¢; 55¢; 10¢.
Warner's Pat., 50¢; 10¢; 10¢.
Stearns' Anti-Friction, 50¢; 10¢; 10¢.
Stearns' Challenge, 35¢; 10¢; 35¢; 10¢; 10¢.
Faultless, 40¢; 40¢; 50¢.
American, 5¢; 10¢; 50¢.
Rider & Wooster, No. 1, 32¢; No. 2, 75¢.
Paragon, Nos. 1, 2 and 3, 40¢; 10¢.
Paragon, Nos. 5, 5¢; 7 and 8, 60¢; 10¢; 10¢.
Crescent, 50¢; 10¢; 10¢.
Nickel, Cast Iron, 50¢.
Nickel, Malleable Iron and Steel, 40¢.
Scranton Anti-Friction Single Strap, 38¢; 40¢.
Scranton Anti-Friction Double Strap, 40¢.
Universal Anti-Friction, 40¢.
Wild West, 4 in. Wheel, \$15.00; 5 in. Wheel, \$21.00, 40¢; 10¢; 40¢; 10¢; 50¢.
Star, 40¢; 10¢; 40¢; 10¢; 50¢.
May, 50¢; 50¢; 10¢; 10¢.
Barry, 50¢, 40¢; 10¢.

Harness Snaps—
See Snaps.

Hatchets—

List Jan. 1, 1886, 35¢; 40¢.
Isaiah Blood, 40¢; 40¢.
Hunt's Shingling, Lath and Claw, 40¢; 40¢.
Hunt's Broad, 40¢; 10¢; 50¢.
Buffalo Hammer Co., 40¢; 10¢; 50¢.
Hurd's, 40¢; 10¢; 50¢.
Fayette R. Plumb, 40¢; 10¢; 50¢.
Wm. Mann, Jr., & Co., 50¢; 50¢; 50¢.
Underhill Edge Tool Co., 40¢; 50¢; 40¢; 10¢.
Underhill's, Haines and Bright, 40¢; 10¢; 50¢.
C. Hammond & Son, 40¢; 10¢; 50¢.
Simmons', 40¢; 10¢; 50¢; 10¢; 50¢.
Polly's, 40¢; 10¢; 50¢; 10¢; 50¢.
Kolly's, 50¢; 10¢; 50¢.
Sargent & Co., 50¢.
Ten Eyck Edge Tool Co., 40¢; 10¢; 40¢; 10¢; 50¢.
Collins, 10¢.

Hay and Straw Knives—

Lightning, Mfrs' price \$18.00, 25¢.
But jobs frequently give extra.
Gem, 50¢; 10¢.
Wadsworth's, 40¢; 75¢; 40¢; 10¢.
Carter's Needle, 50¢; 10¢; 50¢; 10¢; 10¢.
Heath's, 50¢; 10¢; 50¢; 10¢; 10¢.
Auburn Hay, Com. and Spear Point, 50¢.
Auburn, Straw, 40¢.

Hinges—

Wrought Iron Hinges
Strap and T, 75¢; 75¢; 50¢.
Screw Hook and Strap, 6 to 12 in., 30¢; 30¢; 30¢.
Strap, 14 to 20 in., 30¢; 30¢; 30¢.
Heavy Welded Hook, 6 to 12 in., 30¢; 30¢; 30¢.
Hook, 14 to 20 in., 30¢; 30¢; 30¢.
Screw Hook, 1/4 in., 5¢; 10¢; 10¢.
and Eye, 1/4 in., 5¢; 10¢; 10¢.
Rolled Blind Hinges, Nos. 22 and 34, 50¢; 10¢.
Rolled Blind Hinges, Nos. 232 and 234, 50¢; 10¢.
Rolled Plate, 70¢; 10¢.
Rolled Raised, 70¢; 10¢.
Plate Hinges, 8, 10 and 12 in., 50¢; 50¢; 50¢.
"Providence" over 12 in., 50¢; 50¢; 50¢.
Spring Hinges—
Geer's Spring and Blank Butts, 40¢.
Union Spring Hinge Co.'s list, March, 1886, 20¢.
Acme and U. S., 30¢.
Empire and Crown, 20¢.
Hero and Monarch, 50¢.
American, Gem, and Star, Japanized, 30¢.
American, Gem, and Star, Bronzed, net.
Oxford, Bronze and Brass, net.
Barker's Double Acting, 30¢; 10¢.
Union Mfg. Co., 25¢.
Bommer's, 25¢.
Buckman's, 15¢; 30¢.
Chicago, 30¢.
Wiles, 10¢.
Devore's, 40¢.
Rex, 40¢.

Gate Hinges—

Western, 50¢; 40¢; 60¢.
N. E., 50¢; 70¢; 50¢.
N. E. Reversible, 50¢; 50¢; 50¢.
Clark's, Nos. 1, 2, 3, 60¢; 10¢; 50¢.
N. Y. State, 50¢; 50¢; 50¢; 10¢.
Automatic, 50¢; 12¢; 50¢.
Common Sense, 50¢; 50¢; 50¢.
Seymour's, 50¢; 10¢; 50¢.
Shepard's, 50¢; 10¢; 50¢.
Reed's Latch and Hinges, 50¢; 12¢; 50¢.
Blind Hinges—
Parker, 75¢; 25¢.
Palmer, 50¢; 50¢; 10¢.
Seymour, 50¢; 10¢; 50¢.
Nicholson, 45¢; 10¢.
Huffer, 50¢.
Clark's, Nos. 1, 3, 5, 40 and 50, 75¢; 10¢; 50¢; 80¢.

Clark's Mortise Gravity, 50¢; 10¢; 50¢; 25¢; 24¢; 23¢.
Sargent's, Nos. 1, 3, 5, 11, 13, 75¢; 10¢; 75¢; 10¢; 50¢.
Sargent's, No. 12, 75¢; 10¢; 75¢; 10¢; 50¢.
Reading's Gravity, 75¢; 10¢; 75¢; 10¢; 50¢.
Shepard's Noiseless Niagara Buffalo, 75¢; 10¢; 75¢; 10¢; 50¢.
Champion, Steamboat, Clark's Old Pattern and Clark's Tip Pattern, 75¢; 10¢; 75¢; 10¢; 50¢.
Shepard's O. S., Lull & Porter, 75¢; 10¢; 75¢; 10¢; 50¢.
Shepard's Acme, Lull & Porter, 75¢; 10¢; 75¢; 10¢; 50¢.
Shepard's Queen City Reversible, 75¢; 10¢; 75¢; 10¢; 50¢.
Clark's Lull & Porter, Nos. 0, 1, 1 1/2, 2, 3, 75¢; 10¢; 75¢; 10¢; 50¢.
North's Automatic Blind Fixtures, No. 2, for Wood, \$10.50; No. 3, for Brick, \$18.50, 50¢; 10¢; 50¢; 25¢.
Hees—
Handled—
Garden, Mortar, &c., 50¢.
Planter's, Cotton, &c., 50¢.
Warren Hoe, 50¢.
Magic, 50¢; 10¢; 50¢.
Eye—
D. & H. Scovill, 20¢.
Lane's Crescent Planters Pattern, 45¢; 25¢.
Lane's Razor Blade, Scovill Pattern, 30¢.
Maynard, S. & O. Pat., 45¢; 25¢.
Sandusky Tool Co., S. & O. Pat., 60¢.
Hubbard & Co., S. & O. Pat., 60¢.
Chattanooga Tool Co., S. & O. Pat., 60¢.
Grub, 60¢; 10¢; 50¢; 10¢.

Hoes—

Handled—
Garden, Mortar, &c., 50¢.
Planter's, Cotton, &c., 50¢.
Warren Hoe, 50¢.
Magic, 50¢; 10¢; 50¢.
Eye—
D. & H. Scovill, 20¢.
Lane's Crescent Planters Pattern, 45¢; 25¢.
Lane's Razor Blade, Scovill Pattern, 30¢.
Maynard, S. & O. Pat., 45¢; 25¢.
Sandusky Tool Co., S. & O. Pat., 60¢.
Hubbard & Co., S. & O. Pat., 60¢.
Chattanooga Tool Co., S. & O. Pat., 60¢.
Grub, 60¢; 10¢; 50¢; 10¢.

Hog Rings and Ringers—

Hill's Improved Ringers, 50¢; 10¢; 45¢.
Hill's Old Style Ringers, 50¢; 10¢; 45¢.
Hill's Tongs, 50¢; 10¢; 45¢.
Hill's Rings, 50¢; 10¢; 45¢.
Perfect Ringers, 50¢; 10¢; 45¢.
Blair's Hog Ringers, 50¢; 10¢; 45¢.
Blair's Hog Rings, 50¢; 10¢; 45¢.
Champion Ringers, 50¢; 10¢; 45¢.
Champion Rings, Double, 50¢; 10¢; 45¢.
Brown's Ringers, 50¢; 10¢; 45¢.
Brown's Rings, 50¢; 10¢; 45¢.

Holisting Apparatus—

Moore's Hand Hoist, with Lock, 20¢.
Moore's Differential Pulley Block, 20¢.
Energy Mfg. Co.'s, 25¢.

Holders, File and Tool—

Bals Pat., 50¢; 10¢; 40¢; 25¢.
Nicholson File Holders, 20¢.

Hollow-Ware—

Iron—
Stove Hollow-Ware—
Ground, 60¢; 10¢; 50¢; 50¢.
Unground, 60¢; 10¢; 50¢; 10¢; 50¢.
Enamelled Hollow-Ware—
Maslin Kettles, 65¢; 10¢; 50¢.
Boilers and Saucepans, 40¢; 25¢.
Tinned Boilers and Saucepans, 40¢.
Gray Enamelled Ware—
Stove, 50¢; 50¢; 50¢.
Maslin Kettles, 60¢; 10¢; 50¢; 10¢; 50¢.
Boilers and Saucepans, 40¢; 25¢.
Agate and Granite Ware, 25¢.
Rustless Hollow-Ware, 50¢; 50¢; 25¢.
Galvanized Tea-Kettles—
Inch 6 7 8 9
Each 55¢ 60¢ 65¢ 75¢
Silver Plated—
4 mo. or 5 1/2 cash in 30 days.
Reed & Barton, 40¢; 25¢.
Meriden Britannia Co., 40¢; 25¢.
Simpson, Hall Miller & Co., 40¢; 25¢.
Rogers & Brother, 40¢; 25¢.
Hartford Silver Plate Co., 40¢; 25¢.
William Rogers Mfg. Co., 40¢; 25¢.

Hooks—

Cast Iron—
Bird Cage, Sargent's list, 60¢; 10¢; 10¢.
Bird Cage, Reading, 60¢; 10¢; 10¢.
Clothes Line, Sargent's list, 60¢; 10¢; 10¢.
Clothes Line, Reading list, 60¢; 10¢; 10¢; 10¢.
Ceiling, Sargent's list, 55¢; 10¢; 10¢.
Harnes, Reading list, 55¢; 10¢; 10¢; 10¢.
Coat and Hat, Sargent's list, 55¢; 10¢; 10¢; 10¢.
Coat and Hat, Reading, 50¢; 10¢; 50¢; 10¢; 10¢.
Wrought Iron—
Cotton, 50¢; 10¢; 10¢; 10¢; 10¢.
Cotton Pat. (N. Y. Mallet & Handle Wks.), 50¢; 10¢; 10¢; 10¢; 10¢.
Tassel and Picture (T. & S. Mfg. Co.), 50¢.
Wrought Staples, Hooks, &c., 50¢.
Wire—
Wire Coat and Hat, Gem, list April, 1886, 45¢.
Wire Coat and Hat, Miles, list April, 1886, 45¢.
Indestructible Coat and Hat, 45¢.
Wire Coat and Hat, Standard, 45¢.
Belt, 75¢; 10¢; 80¢.

Miscellaneous.

Grass, No. 2, \$2.00; No. 3, \$2.25; No. 4, \$2.50.
Bush, 55¢; 60¢.
Whitmore-Patent, 55¢.
Hooks and Eyes—Malleable Iron, 70¢; 70¢; 10¢.
Hooks and Eyes—Brass, 70¢; 10¢; 10¢.
Fish Hooks, American, 50¢.
Bench Hooks, See Bench Stops.
Horse Nails—
Nos. 6 7 8 9 10
Ausable, 25¢; 25¢; 25¢; 24¢; 23¢.
Clinton, Fin., 24¢; 22¢; 21¢; 20¢; 19¢.
Essex, 25¢; 25¢; 25¢; 24¢; 23¢.
Lyra, 25¢; 23¢; 22¢; 21¢; 20¢.
Snowden, 25¢; 23¢; 22¢; 21¢; 20¢.
Putnam, 23¢; 21¢; 20¢; 19¢; 18¢.
Vulcan, 23¢; 21¢; 20¢; 19¢; 18¢; 17¢; 16¢; 15¢.
Northwest'n, 25¢; 23¢; 22¢; 21¢; 20¢.
Globe, 23¢; 21¢; 20¢; 19¢; 18¢; 17¢; 16¢; 15¢.
Boston, 23¢; 21¢; 20¢; 19¢; 18¢; 17¢; 16¢; 15¢.
A. C., 25¢; 23¢; 22¢; 21¢; 20¢.
C. B.-K., 25¢; 23¢; 22¢; 21¢; 20¢.
Champlain, 25¢; 23¢; 22¢; 21¢; 20¢.

New Haven, 25¢; 23¢; 22¢; 21¢; 20¢; 19¢; 18¢; 17¢; 16¢; 15¢; 14¢; 13¢; 12¢; 11¢; 10¢; 9¢; 8¢; 7¢; 6¢; 5¢; 4¢; 3¢; 2¢; 1¢.
Saranac, 23¢; 21¢; 20¢; 19¢; 18¢; 17¢; 16¢; 15¢; 14¢; 13¢; 12¢; 11¢; 10¢; 9¢; 8¢; 7¢; 6¢; 5¢; 4¢; 3¢; 2¢; 1¢.
Champion, 23¢; 21¢; 20¢; 19¢; 18¢; 17¢; 16¢; 15¢; 14¢; 13¢; 12¢; 11¢; 10¢; 9¢; 8¢; 7¢; 6¢; 5¢; 4¢; 3¢; 2¢; 1¢.
Capewell, 25¢; 23¢; 22¢; 21¢; 20¢; 19¢; 18¢; 17¢; 16¢; 15¢; 14¢; 13¢; 12¢; 11¢; 10¢; 9¢; 8¢; 7¢; 6¢; 5¢; 4¢; 3¢; 2¢; 1¢.
Star, 23¢; 21¢; 20¢; 19¢; 18¢; 17¢; 16¢; 15¢; 14¢; 13¢; 12¢; 11¢; 10¢; 9¢; 8¢; 7¢; 6¢; 5¢; 4¢; 3¢; 2¢; 1¢.
Anchor, 23¢; 21¢; 20¢; 19¢; 18¢; 17¢; 16¢; 15¢; 14¢; 13¢; 12¢; 11¢; 10¢; 9¢; 8¢; 7¢; 6¢; 5¢; 4¢; 3¢; 2¢; 1¢.
Western, 23¢; 21¢; 20¢; 19¢; 18¢; 17¢; 16¢; 15¢; 14¢; 13¢; 12¢; 11¢; 10¢; 9¢; 8¢; 7¢; 6¢; 5¢; 4¢; 3¢; 2¢; 1¢.
Empire Bronzed, 14¢; 13¢; 12¢; 11¢; 10¢; 9¢; 8¢; 7¢; 6¢; 5¢; 4¢; 3¢; 2¢; 1¢.
Horse Shoes—See Shoes Horse.

Hose, Rubber—

Competition, 75¢; 10¢; 75¢; 10¢; 50¢.
Standard, 70¢; 70¢; 10¢.
Extra, 60¢; 60¢; 10¢.
N. Y. B. & P. Co., Para, 30¢; 10¢.
N. Y. B. & P. Co., Extra, 50¢.
N. Y. B. & P. Co., Dundee, 60¢; 10¢; 50¢.

Hushers—

Blair's Adjustable, 5¢; 10¢; 80¢.
Blair's Adjustable Clipper, 5¢; 10¢; 70¢.

Indurated Fiber-Ware.

Spittoons, No. 2, 5¢; 10¢; 67¢.
Basins, Ringed, 5¢; 10¢; No. 1, \$3.70; No. 2, \$3.10; No. 3, \$2.70.
Washbasins, Nested, Nos. 0, 1, 2 and 3 (4 pieces), 5¢; 10¢; 16¢; 16¢.
Kesslers, Nested, Nos. 1, 2, 3 and 4 (4 pieces), 5¢; 10¢; 16¢; 16¢.
Butter Bowls, 15, 17 and 19-inch (3 pieces), 5¢; 10¢; 16¢.
Liquid Measures, pt., qt., 2 qt. and funnel (4 pieces), 5¢; 10¢; 16¢; 16¢.
Dry Measures, 1, 2, 4, 8 and 16 qt. (5 pieces), 5¢; 10¢; 16¢; 16¢; 16¢.
See also Pails.
Jack Screws—See Screws.

Kettles—

Spun. Stamped.
Brass, 7 to 17 in., 24¢; 21¢.
Brass larger than 17 in., 26¢; 23¢.
Enamelled and Tea Kettles, See Hollow-Ware.

Keys—

Lock Ass'n list Dec. 30, 1886, 50¢; 10¢; 60¢; 25¢.
Eagle, Cabinet, &c., 33¢; 25¢.
Hotchkiss' Brass Blanks, 40¢.
Hotchkiss' Copper and Tinned, 40¢.
Hotchkiss' Pad. and Cab., 36¢.
Ratchet Bed Keys, 50¢; 10¢; 15¢.
Wollensack Tinned, 50¢; 10¢.

Knife Sharpeners—

Parkin's, 50¢; 10¢; 40¢.
Applewood Handles, 50¢; 10¢; 40¢.
Rosewood or Cocobolo, 50¢; 10¢; 40¢.

Knives—

Wilson's Butcher Knives, 25¢; 30¢.
Ames' Butcher Knives, 25¢.
Foster Bros' Butcher, &c., 40¢.
Nichols' Butcher Knives, 40¢; 10¢; 15¢.
Ames' Shoe Knives, 20¢; 25¢.
Ames' Bread Knives, 5¢; 10¢; 15¢; 20¢.
Moran's Shoe and Bread, 20¢.
Hay and Straw, See Hay Knives.
Table and Pocket, See Cutlery.
Corn, Auburn Mfg. Co. Western Pat., 50¢.
Corn, Auburn Mfg. Co. Crescent, 35¢.

Knobs—

Door Mineral, 65¢; 68¢.
Door Por. Jap'd, 75¢; 78¢.
Door Por. Nickel, 30¢; 22¢.
Door Por. Plated Nickel, 30¢; 22¢.
Drawer, Porcelain, 60¢; 10¢; 50¢; 10¢; 10¢.
Hemlock Door Knobs, 40¢; 10¢; 10¢.
Yale & Towne Wood, list Dec. 1886, 40¢.
Furniture Plain, 75¢; 10¢; 10¢.
Furniture, Wood Screws, 25¢; 10¢.
Base, Rubber Tip, 70¢; 10¢; 50¢.
Picture, Judd's, 60¢; 10¢; 10¢; 70¢.
Picture, Sargent's, 70¢; 10¢.
Picture, Hemlock, 35¢; 25¢.
Shutter, Porcelain, 65¢; 10¢.
Carriage, Jap., 50¢; 10¢; 60¢; 10¢.

Ladles—

Melting, Sargent's, 55¢; 10¢.
Melting, Reading, 35¢; 10¢.
Melting, Monroe's Pat., 50¢; 10¢; 40¢.
Melting, P. S. & W., 55¢; 10¢; 40¢.
Melting, Warner's, 30¢.

Lawn Mowers—

Standard list, 50¢; 10¢.
Quaker City, 60¢; 10¢.
Enterprise, 60¢; 10¢.

Lanterns—

Tubular—
Plain with Guards, 5¢; 10¢; 4.25¢.
Lift Wire with Guards, 4.50¢; 4.75¢.
Square Plain, with Guards, 4.00¢; 4.25¢.
Sq. Lift Wire, with Guards, 4.25¢; 4.50¢.
Without Guards, 25¢; 5¢; 10¢; 15¢.
Miscellaneous.
Police, Small, \$4.00; Medium, \$7.25; Large, \$9.75, 20¢; 25¢.

Lemon Squeezers—

Porcelain Lined, No. 1, 50¢; 10¢; 30¢.
Wood, No. 2, 50¢; 10¢; 30¢.
Wood, Common, 50¢; 10¢; 30¢.
Dunlap's Improved, 50¢; 10¢; 30¢.
Sammls, No. 1, \$5.00; No. 2, \$3.12; 18¢; 10¢.
Jennings' Star, 50¢; 10¢; 30¢.
The Boss, 50¢; 10¢; 30¢.
Dean's, Nos. 1, 50¢; 10¢; 30¢; 2, \$3.35; 3, \$1.90.
Little Giant, 50¢; 10¢; 30¢.
King, 40¢; 25¢.

Lines—

Cotton and Linen Fish, Draper's, 50¢.
Draper's Chalk, 60¢.
Draper's Mason's Linen, 8 ft., No. 1, \$1.25; No. 2, \$1.75; No. 3, \$2.25; No. 4, \$2.75; No. 5, \$3.25.
Cotton Chalk, 55¢.
Samson, Cotton, No. 4, \$2; No. 4 1/2, \$2.50; 10¢.
Silver Lake, Braided, No. 0, \$6.00; No. 1, \$6.50; No. 2, \$7.00; No. 3, \$7.50; 25¢.
Mason's Linen, No. 3 1/2, \$1.50; No. 4, \$2.00; No. 4 1/2, \$2.50.
Mason's Colored Cotton, 45¢.
Wire Clothes, No. 18, \$3.00; No. 19, \$3.00; No. 20, \$2.50.

Ventilator Cord, Samson Braided, White or Drab Col., 50¢; 10¢; 50¢.

Locks, &c.—

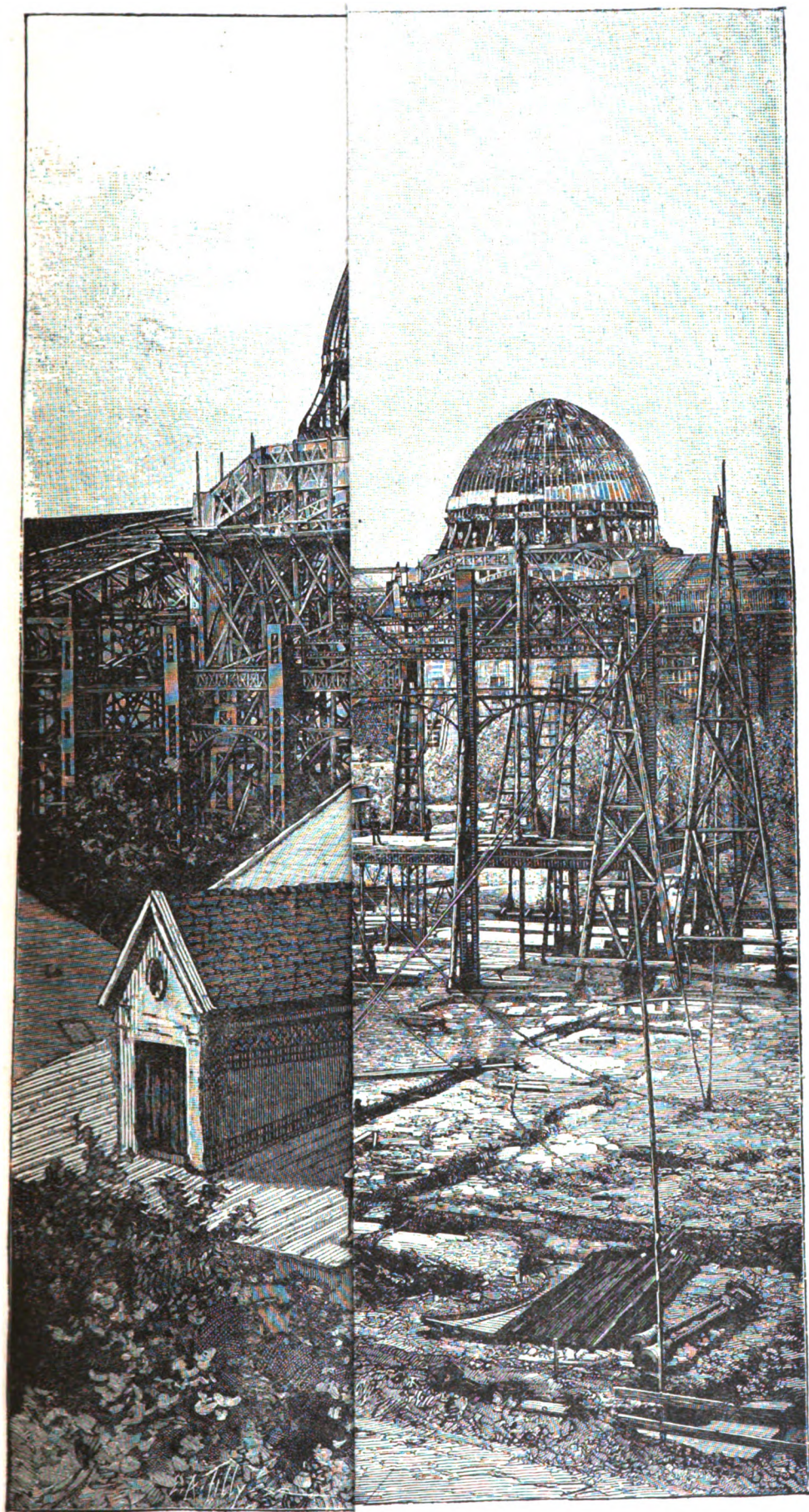
Door Locks, Latches, &c.
List Dec. 30, '86, chgd Feb. 2, '87, 50¢; 10¢; 50¢; 10¢; 50¢.
Mallory, Wheeler & Co., list July, '88, 50¢; 10¢; 50¢.
Sargent & Co., list Aug. 1, '88, 55¢; 10¢; 10¢; 50¢; 10¢.
Reading Hardware Co., list Feb. 2, '88, 55¢; 10¢; 50¢; 10¢.
Livingston & Co., 70¢.
Note.—Lower net prices often made.
Perkins' Burglar Proof, 30¢; 25¢; 30¢; 25¢.
F. Many's "Extension Cylinder" \$10.50; 50¢.
Barnes Mfg. Co., 40¢; 40¢; 10¢.
Yale Corrugated Key, 35¢; 40¢.
Deits Flat Key, 50¢.
L. & C. Flat Key Latches, 30¢; 10¢.
Romer's Night Latches, 15¢.
Yale, new list, 35¢; 40¢.
Shepardson or U. S., 35¢.
Felter or American, 40¢; 10¢.
Seed's N. Y. Hasp Lock, 25¢.
Cabinet—
Eagle, Gaylord Par. list March, '84, rev. Ker and Corbin, Jan. 1, '88, 33¢; 45¢.
Deits, Nos. 86 to 99, 40¢; 10¢.
Deits, Nos. 51 to 63, 40¢; 10¢.
Deits, Nos. 86 to 99, 40¢; 10¢.
Stoddard Lock Co., 30¢; 25¢; 40¢.
"Champion" Night Latches, 40¢.
Barnes Mfg. Co., 40¢; 40¢; 10¢.
Eagle and Corbin Trunk, 35¢; 45¢.
"Champion" Cab. and Comb., 35¢; 45¢.
Yale, 35¢.
Romer's, 35¢.
Padlocks.
List Dec. 23, '84, 75¢; 75¢; 10¢.
Yale Lock Mfg. Co.'s, 35¢; 45¢.
Eagle, 25¢; 35¢.
Eureka, Eagle Lock Co., 40¢; 25¢.
Romer's, Nos. 0 to 91, 30¢.
Romer's Scandinavian, &c., Nos. 100 to 505, 15¢.
A. E. Deits, 40¢.
Champion Padlocks, 40¢.
Hotchkiss, 30¢.
Star, 45¢.
Horsehoe, 50¢; 10¢; 40¢; 40¢; 10¢.
Barnes Mfg. Co., 40¢; 40¢; 10¢.
Nock's, 35¢.
Brown's Pat., 30¢; 10¢; 50¢; 10¢.
Scandinavian, 30¢; 10¢; 50¢; 10¢.
Pratt's Pat. Scandinavian low list, 60¢.
Ames Sword Co. up to No. 150, 40¢.
Ames Sword Co. above No. 150, 60¢.

Lumber Tools.

Ring Peavies, "Blue Line", 50¢; 10¢; 30¢; 10¢.
Ring Peavies, Common, 50¢; 10¢; 30¢; 10¢.
Steel Socket Peavies, 50¢; 10¢; 30¢; 10¢.
Mail Iron Socket Peavies, 50¢; 10¢; 30¢; 10¢.
Cant Hooks, "Blue Line", 50¢; 10¢; 30¢; 10¢.
Cant Hooks, Common Finish, 50¢; 10¢; 30¢; 10¢.
Cant Hooks, Mail Socket Clasp, "Blue Line" Finish, 50¢; 10¢; 30¢; 10¢.
Cant Hooks, Mail Socket Clasp, Common Finish, 50¢; 10¢; 30¢; 10¢.
Cant Hooks, Clip Clasp, "Blue Line" Finish, 50¢; 10¢; 30¢; 10¢.
Cant Hooks, Clip Clasp, Common Finish, 50¢; 10¢; 30¢; 10¢.
Hand Spikes, 50¢; 10¢; 30¢; 10¢; 15¢; 10¢; 15¢; 10¢.

Pike Poles, Pike & Hook, 50¢; 10¢; 15¢; 10¢; 15¢; 10¢;

Machine—	
Flat Head, Iron.....	55¢
Round Head, Iron.....	50¢
Bench and Land—	
Bench, Iron.....	55¢10¢55¢10¢10¢
Bench, Wood, Beech.....	70¢
Bench, Wood, Hickory.....	70¢
Band, Wood.....	25¢10¢25¢10¢55¢
Lag, Blunt Point.....	75¢
Coach and Lag, Gimlet Point.....	75¢
Bed.....	25¢55¢
Hand Rail, Sargent's.....	60¢10¢
Hand Rail, H. & B. Mfg. Co.....	70¢10¢75¢
Hand Rail, Am. Screw Co.....	75¢
Jack Screws, Millers Falls list.....	50¢50¢55¢
Jack Screws, P. S. & W.....	35¢
Jack Screws, Sargent.....	60¢10¢60¢10¢55¢
Jack Screws, Stearns.....	40¢40¢10¢
Scroll Saws—	
Lester, complete, \$10.00.....	25¢
Rogers, complete, \$4.00.....	25¢
Barnes' Builders' and Cabinet Makers.....	25¢
\$15.....	25¢
Barnes' Scroll Saw Blades.....	35¢
Scythe Snaths.....	
50¢25¢	
Shears—	
American (Cast) Iron.....	75¢10¢75¢10¢55¢
Pruning.....	See Pruning Hooks and Shears
Barnard's Lamp Trimmers.....	70¢ doz \$3.75
Tinners.....	20¢25¢
Seymour's, List, Dec. 1881.....	60¢10¢10¢60¢10¢10¢55¢
Heinisch's, List.....	60¢10¢10¢60¢10¢10¢55¢
Heinisch's Tailor's Shears.....	35¢
First quality C. S. Trimmers.....	30¢80¢10¢
Second quality C. S. Trimmers.....	30¢80¢10¢10¢
Acme Cast Shears.....	10¢10¢
Diamond Cast Shears.....	10¢10¢
Clippers.....	10¢10¢
Victor Cast Shears.....	75¢10¢75¢10¢55¢
Howe Bros. & Hulbert, Solid Forged Steel.....	40¢
Chicago Drop Forge & F. Co., Solid Steel Forged.....	70¢
Clauss Shear Co., Japanned.....	70¢
Clauss Shear Co., Nickel, same list.....	90¢
Sheaves—	
Sliding Door—	
M. W. Co., list July, 1888.....	50¢10¢60¢55¢
R. & E., list Dec. 18, 1885.....	55¢20¢
Corbin's list.....	60¢10¢25¢
Patent Roller.....	60¢10¢25¢
Russell's Anti-Friction, list Dec. 18, 1885.....	60¢25¢
Moore's Anti-Friction.....	60¢
Sliding Shutter—	
R. & E., list Dec. 18, 1885.....	60¢10¢25¢
Sargent's list.....	60¢10¢
Reading list.....	60¢10¢10¢
Ship Tools—	
L. & J. J. White.....	20¢55¢
Albertson Mfg. Co.....	25¢
Shoes, Horse, Mule, &c.—	
Horse—	
Burden's, Perkins', Phoenix, at factory.....	\$4.00
Mule—	
Add 1¢ per kg to above prices.	
Or, Wrought—	
Ton lots.....	7¢ 9¢
1000 lb lots.....	7¢ 9¢
500 lb lots.....	7¢ 10¢
Shot—	
(Eastern prices 2¢ off, cash, 5 days.)	
Drop, 7 bag, 25 lb.....	\$1.20
Drop, 7 bag, 5 lb.....	.29
Buck and Chilled, 7 25 lb bag.....	1.45
Buck and Chilled, 7 5 lb bag.....	.34
Shovels and Spades—	
Ames' Shovels, Spades, &c., list Nov. 1, 1885.....	30¢
NOTE.—Jobbers frequently give 5¢ to 7¢ extra on above.	
Griffith's Black Iron.....	50¢10¢
Griffith's C. S.....	60¢80¢10¢
Griffith's Solid C. S. E. R. Goods.....	30¢
Old Colony (Sanford Fork & Tool Co.).....	30¢
St. Louis Shovel Co.....	30¢80¢75¢
Hussey, Binns & Co.....	15¢25¢
Hubbard & Co.....	30¢80¢75¢
Lehigh Mfg. Co.....	50¢10¢
Payne Petroleum & Son, list January, 1886.....	30¢
Remington's (Lowman's Patent).....	30¢10¢40¢
Bowland's, Black Iron.....	50¢10¢
Bowland's Steel.....	60¢25¢60¢10¢
Shovels and Tongs—	
Iron Head.....	60¢10¢60¢10¢55¢
Brass Head.....	60¢10¢10¢
Skeins, Thimble—	
Western list.....	75¢5¢75¢10¢
Columbus Wrt. Steel, list Nov. 1, 1887.....	70¢
Coldbrookdale Iron Co.....	50¢10¢
Utica P. S. T. Skeins.....	60¢
Utica Turned and Pitted.....	35¢
Stoves—	
Buffalo Metallic, S. S. & Co.....	50¢25¢10¢
Barley Flour Sifters.....	70¢ doz \$2.00
Smith's Adjustable Sifters.....	70¢ doz \$2.25
Smith's Adjustable Milk Strainer.....	70¢ doz \$2.00
Smith's Adjustable F. & C. Strainer.....	70¢ doz \$1.75
Stoves, Wooden Rim—	
Mesh 18, Nested, 7 doz.....	70¢ 90¢
Mesh 20, Nested, 7 doz.....	85¢ 1.00
Mesh 24, Nested, 7 doz.....	1.00 1.10
States—	
School, by case.....	50¢10¢
Snaps, Harness, &c.—	
Anchor (T. & S. Mfg. Co.).....	65¢
Fitch's (Bristol).....	50¢10¢
Hotchkiss.....	10¢
Andrews.....	50¢
Sargent's Patent Guarded.....	70¢10¢10¢
German, new list.....	40¢10¢
Covert, New Patent.....	50¢55¢
Covert, New R. F.....	60¢25¢
Covered Spring.....	60¢10¢10¢
Soldering Irons—	
Covert's Adjustable, list Jan. 1, 1886.....	35¢25¢
Spoke Shaves—	
Iron.....	45¢
Wood.....	30¢
Bailey's (Stanley R. & L. Co.).....	40¢10¢
Stearns.....	20¢10¢30¢
Spoke Trimmers—	
Bonney's.....	70¢ doz \$10.00, dis 50¢
Stearns.....	30¢10¢
Ives, No. 1, \$15.00; No. 2, \$12.00 70¢ doz.....	55¢10¢
Douglas.....	70¢ doz \$9.00, dis 20¢
Spoons and Forks—	
Tinned Iron—	
Basting, Cen. Stamp. Co.'s list.....	70¢10¢
Solid Table and Tea, Cen. Stamp. Co.'s list.....	70¢10¢
Buffalo S. S. & Co.....	33¢42¢
Silver Plated—(4 mos. or 5¢ cash 30 days).....	
Meriden Brit. Co., Rogers.....	50¢
C. Rogers & Bros.....	50¢
Rogers & Bro.....	50¢
Reed & Barton.....	50¢
Wm. Rogers Mfg. Co.....	50¢10¢60¢
Simpson, Hall, Miller & Co.....	50¢10¢
Holmes & Edwards Silver Co.....	50¢10¢55¢
H. & E. Silver Co., Mexican Silver.....	50¢55¢
H. & E. Silver Co., Durham Silver.....	50¢55¢
German Silver.....	50¢55¢
German Silver, Hall & Elton.....	50¢55¢ cash
Nickel Silver.....	50¢55¢50¢10¢55¢ cash
Britannia.....	60¢
Boardman's Flat Ware.....	50¢10¢
Boardman's Nickel Silver.....	50¢
Boardman's Britannia Spoons, case 10 lots.....	60¢
Springs—	
Elliptic, Concord, Platform and Half Scroll.....	60¢60¢55¢
Cliff's Bolster Springs.....	25¢
Squares—	
Steel and Iron.....	75¢10¢80¢
Nickel Plated.....	
Try Square and T Bevels.....	60¢10¢10¢70¢
Diastion's Try Square and T Bevels.....	45¢10¢
Winterbottom's Try and Miter.....	30¢10¢
Starrett's Micrometer Caliper Squares.....	25¢
Avery's Flush Bevel Squares.....	30¢55¢
Staples—	
Fence Staples, Galvanized.....	Same price as B.R. Wire
Fence Staples, Plain.....	See Trl. Rep.
Steelyards.....	
40¢10¢60¢	
Stocks and Dies—	
Blacksmith's Waterford Goods.....	30¢
Blacksmith's Butterfield's Goods.....	5¢30¢10¢
Lightning Screw Plate.....	25¢30¢
Reece's New Screw Plates.....	33¢45¢40¢
Stone—	
Hindustan No. 1, 3¢; Axe, 3¢; Slips No. 1, 4¢.....	
Sand Stone.....	7¢ 21¢
Washita Stone, Extra.....	7¢ 19¢20¢
Washita Stone, No. 1.....	7¢ 14¢15¢
Washita Stone, No. 2.....	7¢ 10¢11¢
Washita Slips, No. 1, Extra.....	7¢ 30¢35¢
Washita Slips, No. 1.....	7¢ 24¢25¢
Arkansas Stone, No. 1, 4 to 6 in.....	\$1.50
Arkansas Stone, No. 1, 8 to 9 in.....	\$1.85
Turkey Oil Stone, 4 to 8 in.....	7¢ 40¢
Turkey Slips.....	7¢ \$1.00 to \$1.50
Lake Superior, Chase.....	7¢ 16¢
Lake Superior Slips, Chase.....	7¢ \$1.00 to \$1.50
Seneca Stone, Red Paper Brand.....	7¢ 15¢20¢
Seneca Stone, High Rounds.....	7¢ 20¢25¢
Seneca Stone, Small Whets.....	7¢ \$2.00
Stove Polish—	
Joseph Dixon's.....	7¢ gro \$5.00, dis 10¢
Gem.....	7¢ gro \$4.50, dis 10¢
Gold Medal.....	7¢ gro \$5.00, dis 25¢
Mirror.....	7¢ pro \$5.00, dis 10¢
Lustro.....	7¢ gro \$4.75
Ruby.....	7¢ gro \$3.75
Rising Sun, 5 gro lots.....	7¢ gro \$5.50
Dixon's Plumbago.....	7¢ 8¢ net
Boynton's Noon Day.....	7¢ gro \$5.00
Parlor Pride Stove Enamel.....	7¢ gro \$12.00
Vater Liquid.....	7¢ 3 5 10 gal. cans
gal.....	\$0.90 .80 .70 .60
Yates Standard Paste Polish, 10 lb cans.....	7¢ 15¢
Jet Black.....	7¢ gro \$3.50
Japanese.....	7¢ gro \$3.50
Picnic.....	7¢ gro \$2.50
Diamond O. K. Enamel.....	7¢ gro \$10.00
Bonnell's Liquid Stove Polish.....	7¢ gro \$5.00
Bonnell's Paste Stove Polish.....	7¢ gro \$5.00
Black Eagle Benzine Paste, 5 and 10 lb cans.....	12¢4¢
Black Jack Water Paste, 5 and 10 lb cans.....	12¢4¢
Nickel Plate Paste.....	7¢ gro \$5.00
Tacks, Brads, &c.—	
List, Jan. 2, 1888.—(Note.—Some manufacturers are selling Tacks at slightly higher prices than those named.)	
American Iron Carpet.....	80¢80¢55¢
Swedes Iron Carpet.....	80¢80¢55¢
American Iron Cut.....	75¢75¢10¢
Swedes Iron.....	75¢75¢10¢
Swedes Iron, Upholsterers.....	75¢10¢75¢10¢55¢
Tinned Swedes Iron.....	75¢10¢75¢10¢55¢
Tinned Swedes Iron, Upholsterers.....	75¢10¢75¢10¢55¢
Gimp and Lace.....	75¢10¢75¢10¢55¢
Tinned Gimp and Lace.....	75¢10¢75¢10¢55¢
Swedes Iron Trimmers.....	75¢10¢75¢10¢55¢
Swedes Iron Miners.....	75¢10¢75¢10¢55¢
Swedes Iron Bill Posters or Railroad.....	75¢10¢75¢10¢55¢
Swedes Steel (Swedes Iron price list).....	80¢80¢55¢
Copper Tacks.....	50¢10¢
Copper Finishing, Trunk and Clout Nails.....	50¢10¢
Finishing Nails.....	70¢10¢70¢10¢10¢
Trunk and Clout Nails.....	70¢10¢70¢10¢10¢
Tinned Trunk and Clout Nails.....	70¢10¢70¢10¢10¢
Basket Nails.....	70¢10¢70¢10¢10¢
Common and Patent Brads, 70¢10¢70¢10¢10¢	
Hungarian Nails.....	
70¢10¢70¢10¢10¢	
Chair Nails.....	
70¢10¢70¢10¢10¢	
Zinc Glaziers Points.....	
50¢50¢55¢	
Clear Box Nails.....	
60¢10¢60¢10¢55¢	
Picture Frame Points.....	
60¢10¢60¢10¢55¢	
Looking-Glass Tacks.....	
50¢10¢50¢10¢55¢	
Leathered Carpet.....	
50¢10¢50¢10¢55¢	
Brush Tacks.....	
50¢10¢50¢10¢55¢	
Shoe Finders, list Jan. 2, 1888, 10¢10¢	
10¢10¢55¢	
Lining and Saddle Nails, list Jan. 1, 1888.....	
Silvered.....	30¢10¢10¢
Japanned.....	20¢10¢10¢
Double Pointed Tacks.....	85¢
Wire Carpet Nails.....	50¢10¢
Wire Brads & Nails, see Nails, Wire.....	
Steel-Wire Brads, K. & E. Mfg. Co.'s list.....	50¢10¢
Tap Borers—	
Common and Rind.....	20¢10¢
Ive's Tap Borer.....	33¢45¢
Enterprise Mfg. Co.....	20¢10¢90¢
Clark's.....	33¢45¢
Tapes, Measuring—	
American.....	25¢10¢
Spring.....	40¢
Chesterman's, Regular list.....	25¢30¢
Thermometers—	
Tin Case.....	80¢80¢10¢
Thimble Skeins—See Skeins.	
Ties, Bale—Steel	
Standard Wire, list.....	50¢10¢55¢
Tinners' Shears, &c.—	
Shears and Snips (P. S. & W.).....	20¢25¢
Punches, see Punches.....	
Snips, J. Mallinson & Co.....	33¢45¢
Tinware—	
Stamped, Japanned and Plated, list Jan. 30 1887.....	75¢75¢55¢
Tire Benders, Upsetters, &c.—	
Stoddard's Lightning Tire Upsetters.....	15¢
Detroit Perfected Tire Bender.....	15¢
Tobacco Cutters—	
Champion.....	20¢10¢30¢
Wood Bottom.....	70¢ doz \$5.00 to \$5.25
All Iron.....	70¢ doz \$4.25
Nashua Loco Co's.....	70¢ doz \$18.00 to \$55¢
Wilson's.....	55¢
Sargent's.....	70¢ doz, \$24, dis 55¢10¢
Acme.....	70¢ doz, \$30.00, dis 40¢
Transom Lifters—	
Wollensak's Class 3 and 4, Bronzed Iron.....	50¢
Class 3 and 4, Bronze Metal.....	25¢
Class 3 and 4, Brass.....	35¢
Skylight Lifters.....	35¢
Crown, Eagle and Shield.....	50¢
Rehner's Bronzed Iron Rods, list Jan. 1, 1888.....	50¢45¢
Rehner's Real Bronze or Nickel Plate.....	50¢25¢
Excelstor.....	50¢10¢25¢
Shaw's.....	50¢10¢
Payson's Universal.....	40¢40¢10¢
Traps—	
Game—	
Newhouse.....	35¢40¢55¢
Onedia Pattern.....	70¢70¢55¢
Game, Blake's Patent.....	40¢10¢55¢
House and Rat—	
Mouse Wood Choker, 7 doz holes, 11¢ doz.....	
Mouse, Round Wire.....	70¢ doz \$1.50, dis 10¢
Mouse, Cage, Wire.....	70¢ doz \$2.50, dis 10¢
Mouse, Catch-em-alive.....	70¢ doz \$2.50, dis 15¢
Mouse, "Bonanza".....	70¢ gr \$10.00 net
Mouse Delusion.....	70¢ gr \$18.00, dis 15¢
Rat, "Decoy".....	70¢ gr \$10.00, dis 10¢
Ideal.....	70¢ gr \$10.00, dis 10¢
Cyclone.....	70¢ gr \$5.25
Hotchkiss Metallic Mouse, 5-hole traps.....	70¢ doz 90¢
In full cases.....	70¢ doz 75¢
Trowels—	
Lothrop's Brick and Plastering.....	25¢
Reed's Brick and Plastering.....	15¢
Diastion's Br'k and Plastering.....	25¢25¢10¢
Peace's Plastering.....	25¢
Clement & Maynard's.....	20¢
Rose's Brick.....	15¢80¢
Brick.....	25¢
Worrall's Brick and Plastering.....	20¢
Garden.....	70¢
Triers—	
Butter and cheese.....	25¢
Trucks, Warehouse, &c.—	
B. & L. Block Co.'s list, '82.....	40¢
Tubes, Boiler—	
See Pipe.....	
Twine—	
Flax Twine.....	BC. B.
No. 9, 4 and 1/2 B Balls.....	22¢ 80¢
No. 12, 4 and 1/2 B Balls.....	21¢ 29¢
No. 18, 4 and 1/2 B Balls.....	18¢ 28¢
No. 24, 4 and 1/2 B Balls.....	18¢ 28¢
No. 30, 4 and 1/2 B Balls.....	18¢ 28¢
No. 36, 4 and 1/2 B Balls.....	18¢ 28¢
Chalk Line, Cotton, 1/2 B Balls.....	25¢
Mason Line, Linen, 1/2 B Balls.....	55¢
2-Ply Hemp, 1/2 and 1/4 B Balls (Spring Twine).....	11¢4¢
3-Ply Hemp, 1 B Balls.....	12¢4¢12¢4¢
3-Ply Hemp, 1 1/2 B Balls.....	11¢4¢11¢4¢
Cotton Wrapping, 5 Balls to B.....	15¢4¢15¢4¢
2, 3, 4 and 5-Ply Jute, 1/2 B Balls.....	10¢
Wool.....	8¢4¢8¢4¢
Paper.....	13¢4¢13¢4¢
Cotton Mops, 6, 9, 12 and 15 B to doz.....	18¢
Vises—	
Solid Box.....	60¢60¢55¢
Parallel—	
Fisher & Norris Double Screw.....	15¢10¢
Stephens.....	25¢35¢
Parker's.....	
30¢25¢	
Wilson's.....	
55¢	
Howard's.....	
40¢	
Bonney's.....	
40¢10¢	
Millers Falls.....	
40¢40¢10¢	
Trenton.....	
40¢55¢40¢10¢	
Merrill's.....	
15¢30¢	
Sargent's.....	
60¢10¢10¢	



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THE IRON AGE

THURSDAY, MARCH 7, 1889.

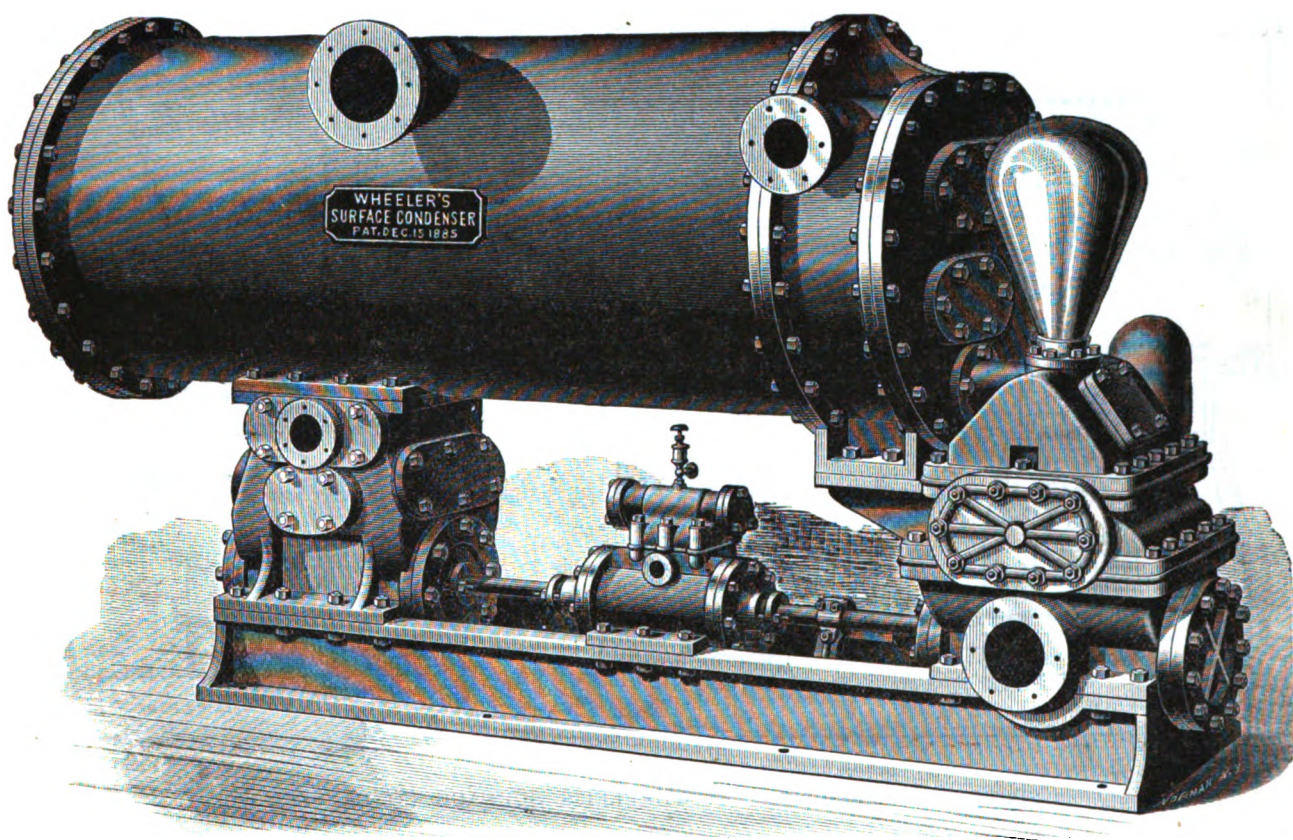
Wheeler's Surface Condenser.

The accompanying cuts illustrate the combination of the Wheeler surface condenser with independent system of air and circulating pumps. The condenser is mounted on the latter, thus saving floor space, which is of considerable importance in engine-rooms that are crowded with machinery. In this design the condenser is firmly bolted down on the pumps, the latter serving as a foundation, thereby saving expense of piping between the pumps and the condenser. As shown by the sectional view on the next page, the water pump delivers the circulating water through the nozzle C directly into the lower section of tubes in the condenser.

or similar materials. In fact, there are no ferrules, washers or packings of any kind employed. The tubes are of seamless brass tubing, carefully tinned inside and outside. They are arranged in pairs, the smaller tube inside of the larger. The latter is thickened at one end, on which a deep thread is chased. This end of the tube is screwed into a head of brass, and on the other end of the tube is screwed a cap, as shown. One end of the small tube is also drawn thick and a thread chased on it. This tube is also screwed into a head of brass. The tubes can be easily taken out and thoroughly cleaned, as their form and the manner of fastening permit of this being readily done. The tightly screwed fastenings of the tubes also permit the use of

Signaling from Mining Cages." 41

An efficient arrangement for signaling by means of electricity from cages in motion in shafts is described in a recent issue of *Engineering*. The object is attained by inserting an insulated copper wire in the hoisting rope and by connecting it at the cage end to an ordinary push button. At the drum end of the rope the insulated wire is brought out and connected to an insulated brass ring working upon the drum-shaft, and upon which a strip of copper rubs so as to maintain an electric connection with the signal bell and battery placed in front of the engineman. Those in the cage by touching the push can instantly communicate with the



WHEELER'S SURFACE CONDENSER, COMBINED WITH INDEPENDENT AIR AND CIRCULATING PUMP.

From thence the water flows by the passageway E into the chamber H, passing through the upper group of tubes, and finally discharging at the outlet nozzle D, as shown by the arrows. The exhaust steam, entering at the nozzle A, comes in contact with the scattering plate O, thereby distributing uniformly over the cooling surface of the tubes. The water of condensation gravitates to the bottom of the condenser, and flows directly to the air pump by the annular passage B, the air pump discharging the water and vapors through the outlet nozzle at the side of the cylinder. Both air and circulating pumps are operated by a direct-acting steam cylinder in the usual way.

In our issue of January 7, 1886, we gave a sectional view of this surface condenser, showing more of the details of construction. It may be well to state here, however, that the arrangement is one providing very thoroughly for the expansion and contraction of the tubes, and this without the use of tube packings of wood, paper

circulating water under pressure, which is often the case with stationary engines where the supply is from a head of considerable height. The circulation of water is very perfect, and consequently the smallest amount of cooling water is required. This feature gives a marked saving in the power necessary for the circulating pump. The condensers are made with bodies of both circular and rectangular shape. The larger sizes are usually of the latter design. The patentee and proprietor of these improved condensers is Frederick M. Wheeler, 98 Liberty street, New York.

The last of the large castings for the hull of the United States cruiser San Francisco, now being constructed at the Union Iron Works, was made at the Pacific Rolling Mills recently. The casting is of steel, and is the port strut for the port shaft of the vessel. The charge of metal in the furnace was 26,000 pounds, and the casting will weigh about 16,000 pounds.

engineman at any part of the lift, and signal to him to stop, or raise, or lower the cage. At the Newbattle Collieries, Dalkeith where the signaling apparatus is now working, it has been applied in the pumping shaft, 300 yards deep, and is specially used by the pump men for working at the pumps in different parts of the shaft. By means of the signal, standing in or upon the top of the cage, the men can instantly signal their requirements. Connections are also put upon the frame of each desk of the cage, so that coal work signals can be made by means of the rope at a great saving of time.

"The application appears," says our contemporary, "to be of special value in case of repairs in the shafts, affording as it does absolute safety to the occupants of the cage in making signals, and it would also be of inestimable value in cases of accident arising from explosion or break up in the winding shaft, where the state of the shaft or of the atmosphere is unknown, and where in such cases many

lives have been lost through the occupants of the cage having no means of signaling to the engineman. A case such as this was the well-known and recent case at the De Beers mine, in South Africa, where the cage and its occupants, including Mr. Lindsay, the manager, was lowered into a deadly atmosphere without means of preventing the descent after the cage left the surface."

Early Anthracite Furnaces.

Oliver Williams, of Catasauqua, reviews as follows the early history of the manufacture of anthracite pig iron in Pennsylvania, in a letter to a local newspaper:

In 1828 Neilson, of Scotland, patented the use of hot air in the smelting of iron ore in the blast furnace. The inventor "built better than he knew," as at that time anthracite coal was practically unknown in Scotland, and the use of his

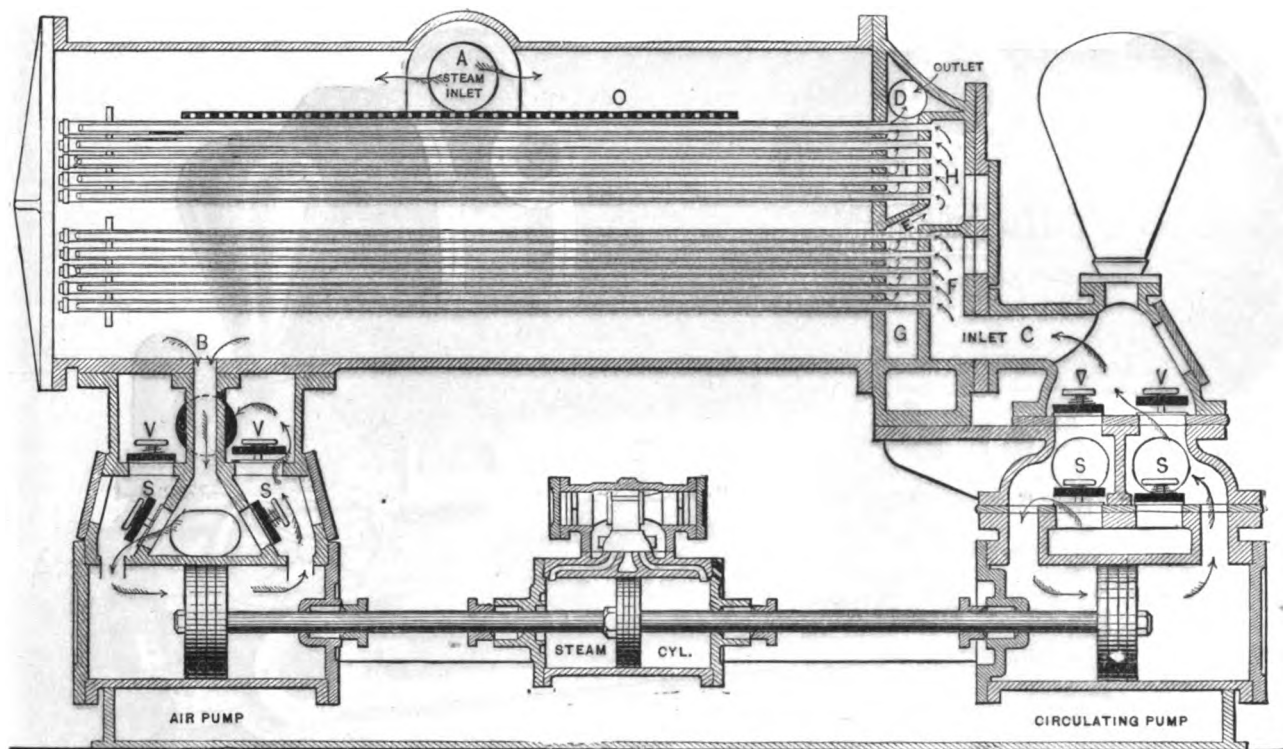
out Dr. Geissenhainer died, and American metallurgy suffered its first great loss.

While these experiments were going on at Silver Creek, John Potts was working on the same lines at Cressonia, Schuylkill County, and with commendable success; but, as in the case of the Valley Furnace, the Potts Furnace was too small and his blast too weak and cold. In 1838 a small furnace at Mauch Chunk was blown in on anthracite coal. It limped along for a few months, and was then blown out. It was again put in blast early in 1839, with an improved hot blast, but after running a short time was abandoned. Mr. F. C. Lathorp, an eminent engineer—still living, I believe, at Trenton, N. J.—was connected with this enterprise, and is fully qualified to write an interesting chapter on the early history of anthracite pig iron.

In 1838 Burch Patterson commenced the erection of the Pioneer Furnace at Pottsville. He engaged Mr. William Lyman, who had been connected with a

These experiments were all being watched by the Lehigh Coal and Navigation Company with intense interest. It is but rarely that so great an amount of brains was ever concentrated in the skulls of a company as was developed in the heads of this company. Two men especially connected with the management—Josiah White and Erskine Hazard, both of Philadelphia—were marvels of foresightedness, indomitable energy and untiring industry. Mr. White was a strict Friend, which must have been a great trial to him sometimes when his plans went awry through the stupidity of his agents.

Philadelphia has erected monuments to many men who have not done one-tenth of what these men did to pour gold into her lap. Mr. White and Mr. Hazard saw that the time had now arrived for them to move in the matter of pig-iron making. Mr. Hazard was sent over to Wales, and there found Mr. Crane's furnace successfully smelting iron ores with anthracite



SECTIONAL ELEVATION OF WHEELER'S SURFACE CONDENSER.

patent was confined to smelting with bituminous coal. In 1836 George Crane, of Wales, obtained a British patent for the use of the hot blast in connection with anthracite coal. Mr. Crane at that time owned an anthracite coal mine at Yniscedwin, South Wales, that was valueless to him. Mr. Crane, in connection with Mr. David Thomas, at once proceeded to change a furnace that had been run on coke, to use anthracite. This furnace was put in blast early in 1837, and it was a complete success from the start. Prior to this Dr. Geissenhainer, a Lutheran clergyman of New York City, a man deeply interested in the sciences and evidently well informed as to Neilson's discovery, and fully appreciating its value as connected with the use of anthracite coal, commenced the erection of a blast furnace on Silver Creek, about seven miles from Pottsville. This was known as the Valley Furnace, and was blown in some time in July, 1836. This furnace continued in blast some ten or twelve weeks, using anthracite coal exclusively. The furnace was small, the pressure of blast about 8 pounds, with a temperature of only some 200° F. Unfortunately, soon after the furnace was blown

rolling mill in Boston, as manager. It was first blown in on the 10th of July, 1839. It continued in blast but a few days, and was shoveled out. Benjamin Parry, who had worked at Yniscedwin with David Thomas, took the position of founder. The furnace was again blown in some time in October, 1839. Mr. Thomas was then in Catasauqua, and Mr. Parry sent for him to come to Pottsville for aid and counsel. Mr. Thomas, accompanied by his son Samuel, then a mere stripling, but now eminent in the trade, drove over to Pottsville and remained there for a week, during which time Pioneer was for the second time blown in. As stated by Mr. Jenks, this furnace then ran successfully, but only for a long enough time to secure the premium of \$5000 (not \$12,000, as stated by Mr. Jenks) offered by Nicholas Biddle to the first person who would make anthracite pig iron continuously for three months. Owing to the poor supply of ores in the vicinity, Pioneer was blown out early in 1840, and remained idle for some time. During the year 1840 several small furnaces were blown in at different points in Eastern Pennsylvania, but none of them proved a commercial success.

coal exclusively, under the management of David Thomas. Mr. Hazard at once contracted with Mr. Thomas to come to this country and erect a furnace. Mr. Thomas arrived here June 5, 1839, and promptly commenced building a furnace at Craneville, now Catasauqua, on the banks of the Lehigh Canal. This furnace, though small, was of far more generous proportions than any of its American predecessors. It was supplied with an improved hot-blast oven capable of heating the air to about 600° F., and with a blowing apparatus giving the pressure of about six pounds to the square inch. Mr. Thomas blew this furnace in July 8, 1840; made his first cast July 4, 1840; continued it in blast—with, of course, the necessary renewals—until 1879, when it was replaced by a furnace of more modern design. This furnace not only made iron, but, equally as important, made money from the word "go." Mr. Thomas followed this up by building the magnificent plants of the Crane and the Thomas Iron Companies, earned for himself the honor of having been the first man in this country to successfully and profitably establish the manufacture of anthracite pig iron, and as such is fairly entitled to

the monument which I trust will be dedicated to his memory on the 4th day of July, 1890.

The Factory Mutual Insurance Companies.

Edward Atkinson, the president of the Associated Factory Mutual Insurance Companies, has published his joint report for the year 1888, 19 companies in New England and Pennsylvania being members of the association. The premiums received in gross in 1888 amounted to \$4,462,059.90, of which \$146,354.99 was returned on policies canceled. The risks, written at the average rate of 0.9081, amounted to \$491,366,988, the net risks carried 12 months being \$475,261,438. The losses incurred were \$848,068.50, a percentage to net premium of 19.65, or 17.84 cents loss per \$100 of risks carried 12 months. The premiums on risks terminated in 1888, on policies issued in 1887, figured up \$4,055,827.78. The dividends returned on the same were \$3,062,306.86, or 75.5 per cent. The average rate of premium charged in 1887 on policies which terminated in 1888 was 89.34 cents per \$100 of risks taken. Deducting the dividend of 75½ per cent., leaves the net cost of insurance, including losses, expenses and taxes, 21.89 cents per \$100. On the 31st of December last the risks outstanding were \$473,928,628.

The practically concurrent action of all the mutual companies and the establishment of systematic and regular inspections of all risks began in 1878. In 1879 the conclusion was reached that the increase of property at risk in almost all mill yards required additional safeguards, which were steadily called for until nearly all risks were protected with suitable apparatus, at the present standard of adequate protection, in or about the year 1883.

Since that date the members have had a right to expect an increase in the percentage of their annual dividends, even though a concession in the rates of premium varying from 5 cents to 25 cents on each \$100 of risks carried has been made in consideration of the additional safeguards called for. Too much clerical work would be required to determine the exact sum of the concessions in the rate of premium. It is computed at not less than \$2,000,000 during the last ten years. Had the old rates been continued, and had this additional sum been paid in to the companies, it would all have been returned in the form of dividends. The average rate of premium placed on deposit with the mutual companies, at the reduction granted during the last five years, has varied but a fraction from 90 cents on each \$100 of risks insured.

The gain in dividends has been as follows:

	Premiums on expired policies.	Dividends.	Per cent.
1884.....	\$3,047,008.61	\$2,047,328.75	67.20
1885.....	3,259,548.82	2,416,419.04	74.12
1886.....	3,455,847.96	2,706,397.50	77.71
1887.....	3,763,203.41	2,667,154.88	70.38
1888.....	4,965,827.78	3,062,306.86	75.50
	\$17,611,416.18	\$12,902,073.88	73.24

The steady progress in preventing loss by fire is most conclusively proved by the regular increase in the rate of dividend.

Per cent.

The dividend of all companies from the respective dates of their organization up to December 31, 1878, the year in which concurrent action and joint inspection were established, had been at the average rate of.....	60.925
In the last five years of this period the increase in risks taken had not been coupled with increased protection, and the average rate of dividend was only.....	59
In the years 1878 to 1883 a steady pressure was exerted for improvement, and from 1884 to 1888, inclusive, the average dividend as above given has been.....	73.26
In the year 1888, taken separately....	75.50

The gain to all members from the concession in rates, with the actual gain in dividends on the reduced rates added thereto, is computed at not less than \$5,000,000 in ten years—1879 to 1888 inclusive—which sum would far more than suffice to cover the estimated cost of all the additional safeguards which have been called for.

STATEMENT No. 4.

Cost of insurance in 19 factory mutual Insurance Companies from the date of their organization, respectively, to December 31, 1888, assuming that all risks should be re-insured on that day, and one-half the premiums received in 1888 applied thereto:

Total amount of risks written.....	\$5,000,580,784.00
Premiums received thereon.....	\$49,347,370.01
Dividends made thereon.....	\$30,633,720.60
Value of assets, \$4,647,308.13. Less deduction for re-insurance.	\$2,157,902.45
	2,490,306.68
The remainder constitutes the cost of insurance.....	\$16,224,343.73

On this basis the cost of insurance has been 28½ cents on each \$100 of risks taken—equal to 32.08 per cent. of the premiums received, but through cancellation from time to time, and by computation for the cancellation of policies which had not terminated December 31, 1888, the amount of risks above written would be somewhat more than had been carried a full term of 12 months. Making allowance for this element of cancellation, the actual cost of insurance for full 12 months on each \$100 of risks taken may be computed at 30 cents per \$100, and the proportion of premium required to meet losses, expenses and taxes may be considered substantially 33½ per cent. of the premium received.

The system of inspection has been more fully perfected during the last year. Additional experts and employees have been required for making special inspections, laying out fire protection, making plans and the like. The cost of this service is assessed in proportion to the amount of risk carried by each company at the end of each year, and, while the increase in the number of risks has called for some additional expense in the aggregate, the proportionate expense to the amount of work done has not been increased, but has of late slightly diminished. According to the experience of the last few years, the cost of general and special inspection, making plans, printing and distributing documents, making special investigations of oil, hose, sprinklers, &c., comes to \$150 per year on each \$1,000,000 of risks insured.

Labor in Connecticut.

The fourth annual report of the Connecticut Bureau of Labor Statistics has been issued. It is an important and interesting work. It opens with the statement of the result of the figures and information taken from the books and pay-rolls of 90 establishments, representing 20 lines of manufacture, in the State. In the fall of 1887 investigation had shown that the real cause of dissatisfaction on the part of the laboring people was that their wages were not just in proportion to the profits received by their employers. On the other hand, employers believed that wages were as high as the condition of business would justify, and that any considerable advance would necessitate the closing of many of the factories and workshops in the State. In many instances, it was asserted, factories were run at a positive loss. As this was the real question, it was decided by the Labor Bureau to enter upon an investigation of wages, cost of living and profits of business in the order named.

The report says there is now far less complaint of unreasoning and unthinking agitation among such employees than before, and a noticeable willingness to adjust questions on reasonable terms. But while there is an abandonment of industrial warfare among the laboring people there is a deep-seated conviction that laborers are losing ground in the industrial turmoil, and that rapidly-changing conditions and methods of production are crowding the workmen into closer and closer lines of activity and reducing the number and range of their occupations and their wages without a corresponding reduction in the cost of living; diminishing the number of small manufacturers and multiplying the number of wage earners as these are crowded out by the large corporations. Just where the trouble lies, or what it is, is not clear to their minds, but in some general way it is summed up that the laborer's share is not in just proportion to his employer's, and that his opportunities to rise are diminished.

When the manufacturers were questioned, the wages of the present time were compared with those of 1860, and in this examination it was found that many of the officials of the concerns now were formerly common laborers in the same employ. In many of these corporations the ranks of laborers are carefully watched for men having the necessary qualifications for advancement; hence the report says it is a mistake for the laboring man, because the conditions of his lot seem hard, to relax his efforts to do his best at all times. The contract system of work in many factories, it is said, gives money to contractors which ought to go to laborers; and it does so because laboring men have not been wise enough to make it for their employers' interest to dispense with the middleman. The plan of weekly payments has gained in favor during the past year. It is very generally favored, but some of the corporations have not yet adopted it; and this is probably the most fruitful source of complaint among the laboring people to-day, as the non-adoption is regarded as a sort of intimidation.

The law limiting the work for women and children to 60 hours per week is generally conscientiously obeyed, but that compelling the attendance of children under 18 years of age at school is enforced with difficulty, unscrupulous parents resorting to various subterfuges to keep their children at work in the mills. Commissioner Hotchkiss, in conclusion, deprecates the blacklisting of employees and the boycotting of employers, and says they are both relics of barbarism, and that their very names should be forgotten. Under the head of manufactures it is shown that the 90 establishments above referred to manufactured in 1887 goods to the value of \$46,618,192.80, at a net profit of \$2,868,191.75. The wages of the 28,256 hands employed amounted to 29.17 per cent. of the cost of goods manufactured, or \$12,470,277.87. The statistics on comparative wages and the cost of food, 1860 to 1887, show that there has been an average advance in the wages of males in the occupations shown since 1860 of 48 per cent. and of females 57 per cent.

A number of Chicago manufacturers were burned out by a fire at 63 and 65 South Canal street, on the 24th inst. The basement was occupied by W. H. Casper & Co., manufacturers of metallic weather strips, and H. S. Holden, manufacturer of gas fixtures. The first floor was used by Goodell & Waters, manufacturers of wood-working machinery. Underwood & Co., manufacturers of baking, were on the third floor. All lost quite heavily, but were fully insured. This building was rebuilt last April after having been partially destroyed by fire.

Great Britain's Coal Supply.

R. Price-Williams, in a paper before the British Statistical Society, follows very closely in his argument concerning the exhaustion of England's coal resources the methods of Prof. Stanley Jevons and of the Royal Commission of 1866. In 1871 the commissioners reported a period of 350 years as the length of time assigned for the working out of the coal supply of the United Kingdom. According to Mr. Price-Williams, this is an over-estimate, and, assuming that the report of the Royal Commission was based on sufficient data, he is certainly justified in the conclusions he has arrived at. That these latter are very startling, it must be confessed. Mr. Price-Williams states that, at the present rate of consumption, all the known sources of supply, with the solitary exception of the Debieghshire and Flintshire coal fields, will be exhausted by the year 1883. The western division of South Wales, with its invaluable steam coals, will be exhausted in 46 years; Warwickshire will cease to produce coal in 53 years; Scotland will in 92 years have to seek its fuel elsewhere, and in two years more even Northumberland and Durham will be denuded of their mineral wealth. Of course Mr. Price-Williams's argument depends upon the maintenance of the present average rate of output, but, even if that rate is reduced, it is obvious that the only result will be a proportionate addition to the number of years which must elapse before the inevitable exhaustion is accomplished. The author of the paper and several of the speakers who followed him very fairly alluded to the great economy of fuel in modern methods for the manufacture of steel, and consequent on the introduction of double and triple expansion engines. These economies, however, cannot materially affect the ever-increasing growth of the coal exports, for which there is no remedy. Any idea of an export duty is quite out of the question, for, as was pointed out, England, with its vast carrying trade, is, and must ever be, so long as that trade exists, the chief benefiter from her coal exports. The only remedy for the evil pointed out is the exercise of judicious economy in the use of that most precious gift which nature has bestowed.

A General Bankruptcy Law.—A movement in favor of a general bankruptcy law has been initiated by the wholesale grocers of St. Louis, and at a convention held in that city last week nearly all the boards of trade and financial organizations in our leading cities were represented by delegates. Col. J. L. Torry, of St. Louis, was made permanent chairman, and George H. Stone, of Chicago, secretary. John H. Goddard, president of the Wholesale Grocers' Association, said, in stating the object of the convention: "A national law that will provide for the honest collection and disbursement of the assets of an insolvent debtor. We want this law so framed that it will accomplish its work quickly and economically. It must be a stringent law, one that will punish the fraudulent debtor, so far, at least, as to make him liable for his debts until they are paid, while at the same time it will not crush the poor but honest debtor, and prevent him from again engaging in business. We believe that all creditors should share fairly and proportionately in the assets of the debtors." Before adjourning, the convention passed resolutions urging upon Congress the adoption of the Lowell bill, passed by the Senate, as the basis of the desired legislation.

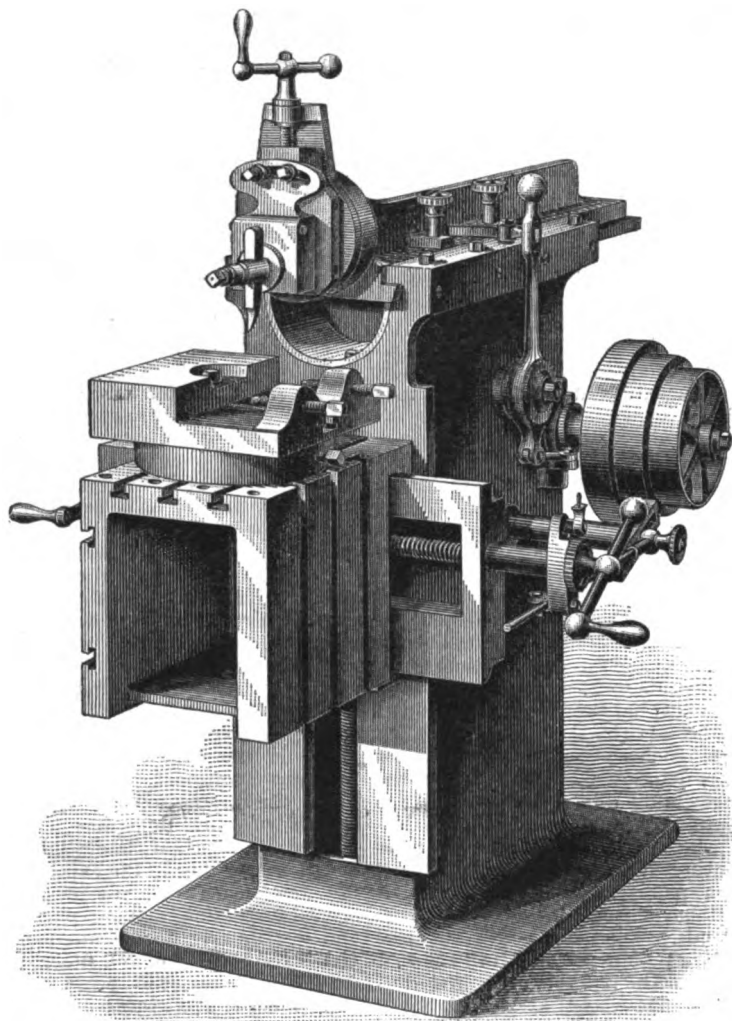
The Pennsylvania repair shops at Pittsburgh will be removed to Watts Station, 14 miles distant, and roundhouses to hold 800 engines will be built at the

same point, where 800 men are engaged in changing the bed of Turtle Creek for over a mile, thus reclaiming a large track of waste land for the new location.

The Prentiss Friction Shaper.

By shifting the tappets, or dogs, which are similar to those in general use, the stroke of this machine can be changed without stopping to any length from $\frac{1}{4}$ inch to its full extent. There are two different speeds for cutting hard or soft metals, and the return stroke is 40 per cent. quicker than the cutting stroke. The grip is produced by two leather surfaces brought together in such a way as to

contracted, and its leather lining is pressed either against the inside of the outer pulley *g*, the top of which runs toward the front of the machine, or it is pressed around the outside of the inner pulley, which runs in the opposite direction. Both pulleys are driven from the same countershaft, one with open and the other with crossed belt. The pulleys have long hubs, and are loose on the shaft. One of the arms, *f*, is fastened to the shaft, thus imparting either a forward or backward motion. On the shaft is mounted a pinion, which engages with a large intermediate gear, *h*, loosely fitted on shaft 2. On the arms of this gear is a ring turned on the inner side to receive, under friction, a leather-faced steel spring having



FRICION SHAPER, BUILT BY THE PRENTISS TOOL AND SUPPLY CO. NEW YORK.

cause the grip to tighten in proportion to the resistance of the work. This enables the machine to take an exceptionally heavy cut—in fact, all the driving belt can pull without danger of slipping. The friction consumes no power except when feeding.

In the sectional side elevation we show the construction of the grip. When the hand-lever *a* is moved forward or back, either by hand or by the tappets *b* on the ram *N*, it will, through the connecting-rod *c*, rock the yoke *d* and shift a sleeve which is fitted loosely on the shaft. This sleeve holds a ring provided with two opposite notches engaging spirally-shaped fingers, which are attached to the two arms *f*, *f*. The ends of these arms are fastened to the ends of a steel band, which forms nearly a complete circle, and is lined on both sides with leather. When the hand-lever *a* moves, this band is either expanded or

lugs on each end. An arm fastened to the shaft engages with and is driven by one or the other of these lugs until arrested by one of the stationary stops *k*, thereby producing an intermittent rocking motion to drive the feed mechanism. When striking the stops the spring ring is relieved and the gear is freed to move without friction. The hub of this gear forms a second pinion, which drives the ram by means of the table gear *m*. One end of the shaft of this gear extends beyond its bearings, and is provided with two disks and adjusting nut, and forms the fulcrum of the hand-lever, on which the disks produce just enough friction to keep it and all parts connected with it in the required position to the end of the stroke of the ram, when, by one of the tappets, the position of the lever is reversed, thereby reversing the motion. This shaper is built by George Juenget & Sons, of Croton Falls,

N. Y., of whom the entire output is taken by the Prentiss Tool and Supply Company, of 42 Dey street, New York.

Our New Armor-Clads.

The interest felt in the unarmored cruisers and torpedo craft, now one after another approaching completion, has naturally diverted attention from the more slowly progressing armor-clads. Of these there are no fewer than ten authorized or already under construction, without taking account of the 13 single-turret monitors in ordinary, which could perform some service, if needed, in harbor defense.

The five double-turret iron monitors, the first of which is nearly ready, have side

fensive efficiency, and their light draft will give them an advantage in maneuver in many harbors over deep-draft hostile armorclads.

Indeed, it may be said that the monitor type modernized gives the basis for a nearly perfect harbor-defense vessel. As there is no necessity for those great space allowances for coal and provisions which the sea-going armorclad must have, everything can be made to turn on armor and armament, supplies and fuel being furnished from the shore up to the time of conflict. In the sixth coast-defense armorclad, authority for which was given two years ago, a sum of \$2,000,000 being allowed for its construction, we find the best features of the monitor type introduced. The bids for it will be opened in a few weeks, as the specifications have just been

ized but not yet fully planned. The fourth is the one designed by Congressman Thomas, to which both the Senate and the House have agreed, though with some differences in detail, now the subject of conference. The Maine will carry four 10-inch and six 6-inch guns of the type already spoken of. The difficulty in securing proper steel materials for this vessel has been great, so new to this country is the industry of building large modern ironclads wholly of domestic materials. Even the use of the materials, when properly furnished, is not always skillful, and losses are thereby occasioned. The Texas is much less advanced than the Maine, because incongruities were discovered which have required the modification of her original plans in order to carry out the purposes of the department in her construction. She will carry two 12-inch and six 6-inch guns. The third armored vessel, provided for last year, will have about 7500 tons displacement, and will carry four 12-inch guns. Her engines will give her probably about 17 knots speed, and with 16 inches of solid steel armor on a water-line belt extending clear fore and aft, she will be one of the most valuable fighting ships to be found anywhere. The tenth of our new armor-clad vessels will be the sea-going partly submerged monitor. Its speed and other details cannot be positively described until an agreement is reached on this subject by Congress, but its plans in general have been mainly approved by naval experts.

The Kearsarge Copper Company.

The operations of the Kearsarge Copper Company, one of the new Lake Superior mines, in 1888 show this general result:

Mineral product 946,876 pounds,	
yielding at 86.83 per cent. 829,185	
pounds refined copper, sold for.....	\$137,609.71
Interest receipts.....	1,458.65
Assets January 1, 1888.....	56,479.56

Total.....	\$195,547.92
Expenditure:	
Operating.....	\$72,554.60
Smelting, freight, &c.....	10,579.43
Total.....	\$83,134.03
In-mine plant.....	18,173.79
	\$101,307.82

Assets January 1, 1889.....	\$94,240.10
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<i>Assets.</i>	
Cash at Boston.....	\$7,303.75
Cash at mine.....	562.68
Supplies at mine.....	1,630.73
Bills receivable.....	44,449.75
250 shares.....	25,000.00
Copper on hand, 560,885 pounds....	43,046.03

Total.....	\$122,082.94
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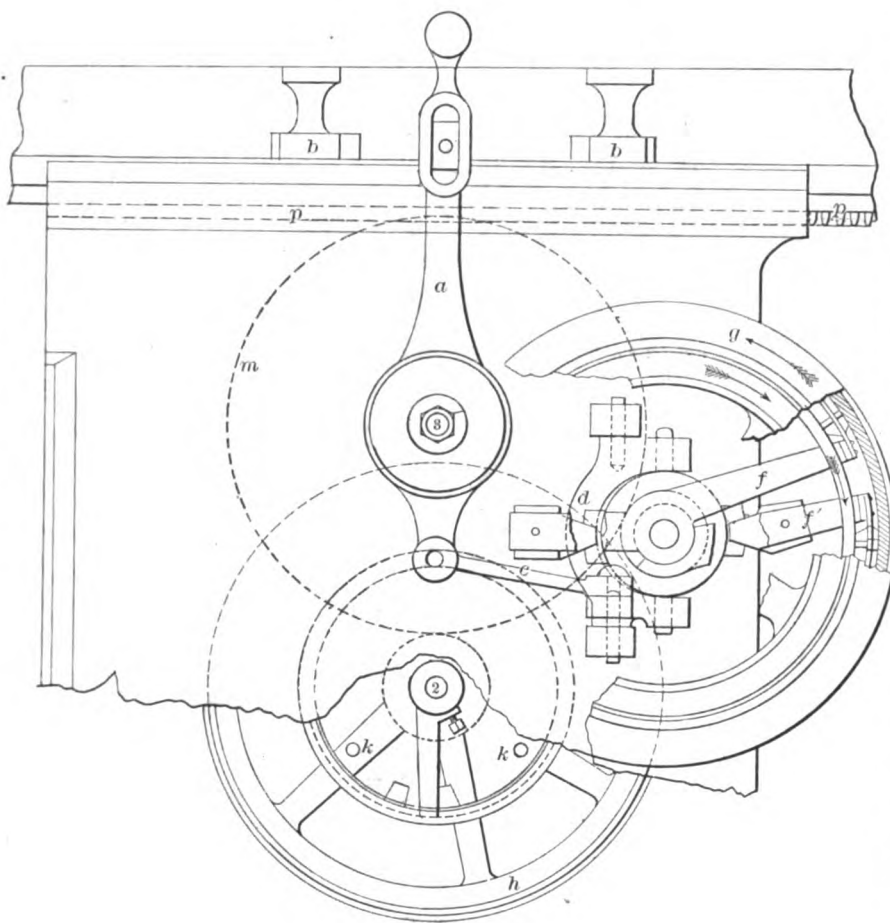
<i>Liabilities.</i>	
Drafts outstanding.....	\$11,536.68
Accounts payable.....	16,312.16

Total.....	\$27,848.84
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Balance of assets January 1, 1889....	\$94,240.10
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The mineral yielded the large average of 86.83 per cent. of ingot copper, which was sold at an average price of 16.6 cents per pound. President Van Brunt says the mine has been producing only since last August. The stopes in the two upper levels have held out remarkably well for copper, and continue to do so, while the lower levels have been somewhat disappointing. Strong hopes, however, are entertained of better results later on. The company have the use of one of the Osceola stamps on very favorable terms for what rock they have to treat, so that for the present, and until the mine is further developed, it does not seem wise to erect stamp mills of their own.

The extensive cordage works at Elizabethport, N. J., are to be enlarged by an additional structure 450 feet long and 60 wide, permitting the employment of 1200 operatives.



SECTIONAL SIDE ELEVATION OF PRENTISS FRICTION SHAPER.

armor not as thick as it should be, except in the case of the Puritan, but their turrets are covered with 11½ inches of steel. They all carry four 10-inch steel breech-loading rifles, firing projectiles that weigh 500 pounds with a powder charge of 250 pounds. This gun will pierce 23 inches of wrought iron at the muzzle and 17½ at the distance of a mile, and at this latter distance the 30 inches of freeboard exposed by the Puritan makes a hard mark to hit, while in the other four the exposed side is only 25 inches. This is the real source of the reliance which may be placed even on the four which have but 7 inches of side armor. As to the Puritan, which has 12 inches of side armor, as a harbor defense vessel she need not fear to attack any opponent. Their guns, which are of the best modern type, can be brought into play at a distance which gives the enemy a most difficult target, with shots likely to glance from the low cylindrical turrets. Double bottoms, water-tight compartments and protective decks aid their de-

completed at the Navy Department. She is to have a length of 250 feet, a breadth of 59, and a depth of a little over 11½, with a displacement of 4000 tons. Her steel armor will be 16 inches thick at the maximum, and her engines are to develop 5400 indicated horse-power. She is to carry a 16-inch breech-loading rifle weighing, exclusive of the carriage, at least 107 tons, and throwing a 2000-pound projectile with a powder charge of 1000 pounds. This will be capable of penetrating at the muzzle more than 36 inches of wrought iron. She will also carry a 12-inch, high-power rifle, having a projectile of 1350 pounds, propelled by a powder charge of 675 pounds, and having a muzzle penetration in wrought iron of 32 inches. A dynamite tube and a powerful secondary battery will complete her armament.

Besides these six harbor-defense vessels we shall have four sea-going armor clads. Two of these, the Maine and the Texas, are building at Brooklyn and Norfolk. A third, larger than either, has been author-

Automatic Four-Slide Wire Forming Machine.

This machine is designed to form wire into a great variety of shapes, such as furniture drop handles, buckle frames, round and oval rings, screw-eye blanks, handles for dripping-pans, belt hooks—in fact, almost any article that can be bent around a form can be made on this machine. The mode of operation is as follows: The wire is drawn through a series of rolls by the feed, which straightens and carries it through a cut-off die and in front of a form which is the shape of the article to be formed. It is then cut off by the action of the four slides and is bent around said form. Then by another motion the article is thrown off the form and drops into a box or other suitable receptacle under the machine. The four slides are operated from the four sides of the machine by means of positive motion cams

and strong, it is easy to adjust and operate, and when once started it will run without close attention until the end of wire is reached. The manufacturers claim it to be the simplest, the cheapest and most unique and durable machine in the market. This machine is built in several sizes. For further information address the E. J. Manville Machine Company, Waterbury, Conn.

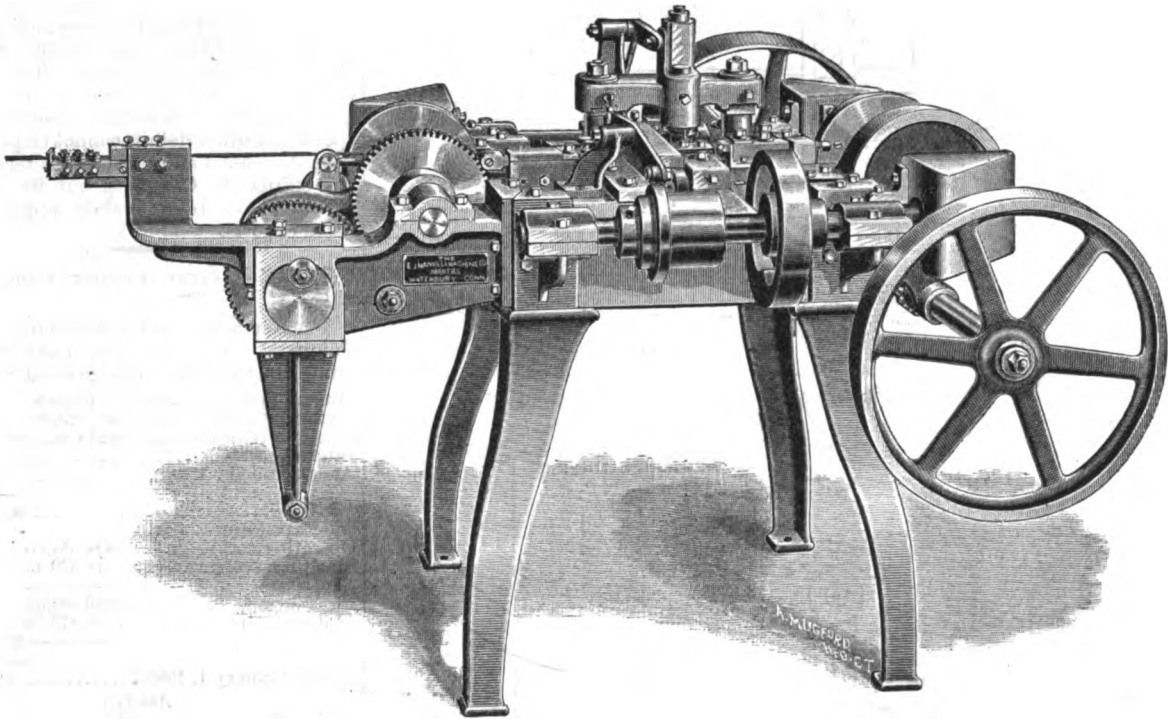
The Chinese Wall.

The Chinese Wall is no myth, contrary to recent assertions. Built 1700 years before America was discovered, 1600 miles of it still remain erect. A correspondent who recently rode two days from Peking and mounted its ramparts said:

I could see it climbing the mountains and going down the valleys as far as my eyes could reach. It did not diminish in strength nor size at the various points I visited, and its masonry would have been

mines, of which the builders and architects constructed the mighty Cathedral of Milan.

A gigantic safe-deposit vault weighing 500 tons, and constructed of miter blocks, none of which are less than a foot thick, has been built in Pittsburgh by the National Safe Deposit in Vault Company, and finished at the foundry of the Griffin Car Wheel Company, in Cleveland, Ohio. It is 81 feet long and 17 feet wide, with two doors, each weighing 5½ tons, without lock, knob or dial, which are moved transversely on rollers across the recesses by a system of gear work that is built in the foundation blocks and secured by a locking device that is set in the floor in front of the vault. The doors themselves are secured by a series of steel bolts, operated by a double automatic bolt-throwing device, which is in turn regulated by a chronometer, triple-movement



AUTOMATIC FOUR-SLIDE WIRE FORMING MACHINE, BUILT BY E. J. MANVILLE MACHINE COMPANY, WATERBURY, CONN.

which are keyed to the shafts. These cams are made of cast iron with hardened cast-steel working parts. These hardened parts work against a hardened and ground roll which revolves on a pin, thus reducing the friction to a minimum. The form is fastened rigidly in a casting, in a manner that renders it perfectly solid, but the casting or form holder is made adjustable on the bed of machine, so as to allow for any inaccuracy in the making of the form and to compensate for different shapes which it may be necessary to make. The holding of the form solidly has been proven, by practical experience, to be a great improvement over a movable or traveling form. The machine, as illustrated, has a positive-grip feed, which for small wire is considered preferable, but a roll-feed, however, can be applied, as the nature of the work governs the case. If it is desired to straighten and cut the wires to be formed by some other device, a hopper feed can be applied that will carry the wires one by one to the tools, as practically as if fed by a positive feed. The cut shows the machine back geared, which feature can readily be dispensed with providing the work to be performed does not require it. While it is sufficiently heavy

good work for the American builders of to-day. It is about 25 feet high, and at the top it is so wide that two carriages could drive abreast along it and the hubs of one would not touch those of the other. Its exterior walls are of blue brick of such a size that they look like massive stones, and these are filled in with earth and paved with brick at the top. The grass and the moss have now grown over the top of this great wall. No archers now guard it, and it stands amid the snowy mountains a monument of the almond-eyed men who thus, 2000 years ago, sought to protect their homes and those of their descendants for all time to come. No one can stand upon the ramparts of this structure and not be impressed with the greatness of the Chinese nation. It is a greater monument than the pyramids of Egypt, built by selfish kings for royal tombs, and its purpose was nobler. It is a monument also of the great truth that while man dies his work remains, and that the lives bottled up here 20 centuries ago exist to-day, as does the hand that carved the Venus di Medici, the pen that wrote Shakespeare and the Æneid, and, in a humbler though no less effective way, the muscle that dug out the marble from the

time lock. Altogether there are 400 blocks, composed of a special quality of cold-blast charcoal and Salisbury iron, forming a car-wheel mixture. There is a hard chill of 2 inches on the outer surface of each metal block. This chill is so hard that no steel tool can penetrate it. The side and end walls are composed of separate blocks, each block having a tongue and a corresponding groove upon their adjacent horizontal faces, and a dovetail joint upon the adjacent vertical faces. All the dovetail joints are drawn up with steel keys. Two steel tie rods, 2½ inches in diameter are passed vertically through each course of wall blocks, the lower ends of such rods engaging with wrought-iron square nuts set in the outside course of floor blocks. The roof of the vault is constructed of a series of blocks of the same material and thickness as the wall blocks.

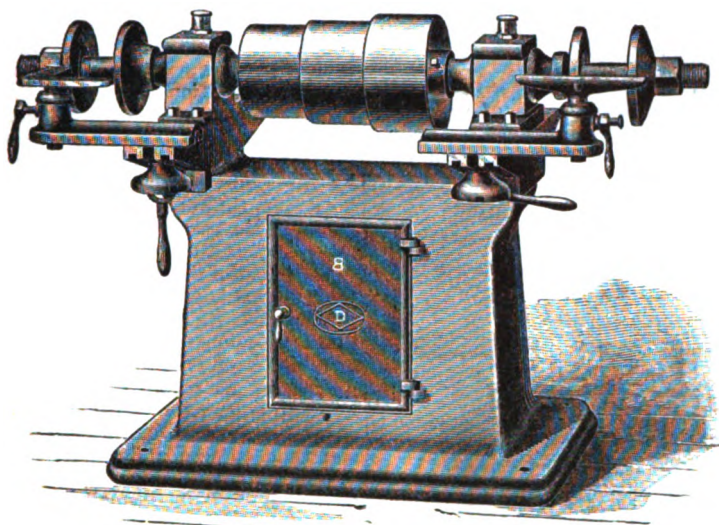
In Sweden hollow steel ingots are being made by casting steel in molds hung on trunnions, allowing the sides to chill to the required thickness and pouring out the steel still liquid in the center. These hollow ingots go to England, where they are drawn out cold to tubing.

Large Grinding Machine.

We illustrate on this page a new grinding machine just produced by the Diamond Machine Company, Providence, R. I., who have a branch at 51 South Canal street, Chicago. It is especially adapted for use in large foundries and machine shops, and is a very heavy and solid machine, which insures steadiness. The aim has been to make the construction through-

or profit upon steel rails until some mode of combination has been adopted by the trade. The hope of forming such a combination has by no means been given up. Negotiations are still proceeding with a view to some reasonable arrangement being come to among the 16 firms who make steel rails, and the directors have recently taken an important step in sending round to the directors and general managers of the various companies and

diagonally with pieces of rubber instead of bristles, as at present used in street sweeping. Under the driver's feet is a water-pipe, from which copious jets of water are thrown, washing away the sand, which is swept into the gutter and washed into the sewers. The machine cleaned two blocks in Fifth avenue, leaving the stone pavement as clean as it would appear on a summer's day. The time occupied was six minutes on each block.



LARGE GRINDING MACHINE, BUILT BY THE DIAMOND MACHINE CO., PROVIDENCE, R. I.

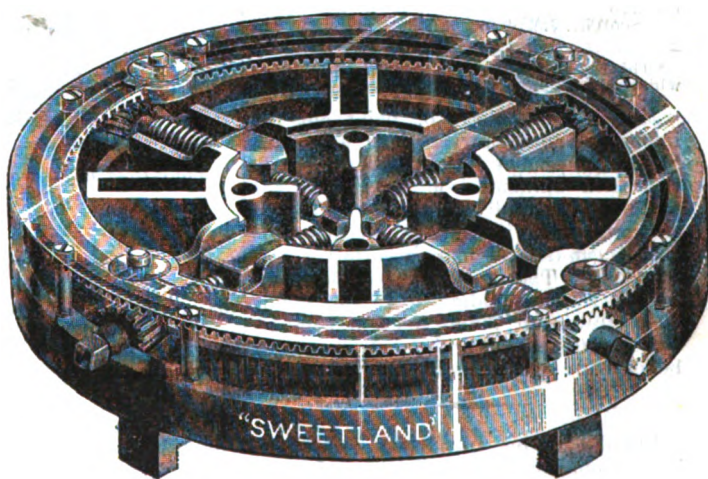
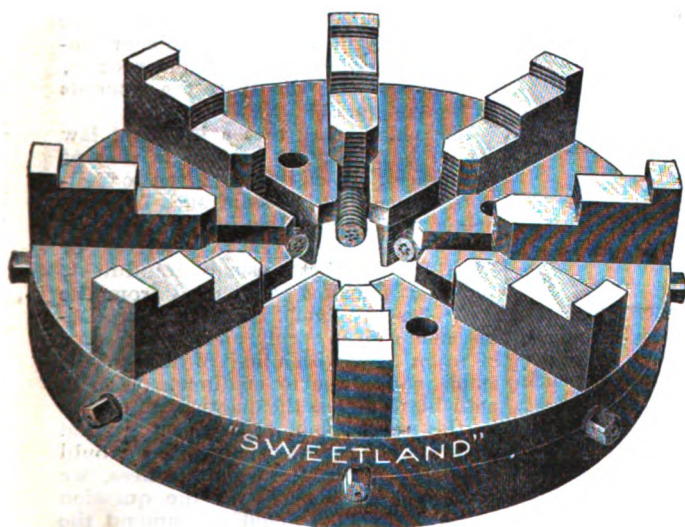
out of equal finish to the best make of engine lathes. It has steel spindle, engine lathe boxes and arms for rests, both front and back. It will run two emery-wheels up to 34 inches in diameter, of any thickness up to 5 inches. It has bear-

members of the firms interested a carefully-considered circular on this subject, in the hope of advancing the object in view and of obtaining for all parties a fair return, but no more than a fair return, for the capital invested in the business. Mean-

The Sweetland Eight-Jaw Chuck.

This chuck is intended principally for use in chucking articles which require an extra strong grip to hold them. An important advantage is also gained from the fact that, as the pressure is distributed over eight points, all danger of the article held springing out of shape is eliminated. The Sweetland is a combination chuck, both independent and universal. Its construction is so plainly shown by the accompanying engravings as to render a description in detail unnecessary. It is made by the Hoggson & Pettis Mfg. Company, of New Haven, Conn.

The Gatling Gun.—The Gatling Gun Company, Limited, of England, which was some time ago formed for acquiring from the Gatling Gun Company of America the patent and manufacturing rights for Europe and the whole Eastern hemisphere, has, says an English contemporary, "purchased the Birmingham works of the defunct National Arms and Ammunition Company. The works and site, which cost the late company about £120,000, were purchased for the present holders for £30,000, and about £15,000 are being spent in adapting them for the manufacture of Gatling guns and ammunition. The machine shops have been re-floored and repainted, and a large number of the machines which are obsolete are being converted on the pattern of those in use in



EIGHT-JAW CHUCK, MADE BY THE HOGGSON & PETTIS MFG. COMPANY, NEW HAVEN, CONN.

ings 9 inches long, the size of spindle in the bearing being $2\frac{1}{4}$ inches, with 2-inch spindle between flanges. The machine stands 32 inches high from floor to center of spindle, and its weight, complete with countershaft, is 1050 pounds.

The International Steel Rail Syndicate is referred to in the following terms by the directors of the Rhymney Iron Company, one of the large English works: "Judging from past experience, it would seem to be impossible to obtain under existing competition a reasonable price for

while the directors are devoting their attention to decreasing the quantity of steel rails manufactured and increasing their output of tin plate, bars, and other special branches, which may from time to time afford a better result, pending the possibility of realizing a profit on steel-rail manufacture."

A new street-sweeping machine is on trial in New York City. The machine is a large circular water tank, running on three wheels, underneath which are placed large rollers or scrapers set

the American factory. It is stated that when the factory is in full work it will find employment for nearly 1000 men and women, and the establishment, when fully organized, will be capable of turning out about 1000 machine guns a year and 3,000,000 cartridges per week. Hitherto the European manufacture of the Gatling gun has been carried on for the American company at the Elswick works. The new works at Birmingham are under the direction of Mr. J. Accles, who is the inventor of several improvements in the gun."

"Blackband" Iron.

Apropos of the fact, recently alluded to in *The Iron Age*, that the Chicago pig iron makers are striving more than ever to control their home market, comes a very "natty" publication from the office of Charles Himrod & Co., of that city, entitled, "A Few Remarks About Blackband Irons." It consists of cardboard leaves tied together with scarlet ribbon, but despite its innocent appearance it throws down the gauntlet to the Ohio makers of soft irons in a very positive, not to say aggressive, manner. First, the statement is made that the soft Ohio irons, known as blackband irons, have been of such excellent quality as to replace almost everywhere the imported irons formerly used for softeners. Next, it is declared that the increasing cost of Ohio blackband ores and the receding price of iron have compelled the Ohio furnacemen to replace their native ores with Lake Superior ores, but they still call their irons "blackband" irons, and they are in fact just as good as they were when native ores were used. This is proved by the experience of one of the most successful foundry iron companies in Ohio, whose product has always sold at the top of the market as a "blackband" iron, while it did not contain enough blackband ore to affect its character. The logical sequence then follows—namely, "there is no good reason why the same ores will not make as good iron in Chicago as they will in the Mahoning or Shenango valleys." The statements following are made to prove that not only are the identical ores available for the use of Chicago iron makers, but that analyses of pig iron made from them show as good results as the Ohio irons or imported Scotch. The following comparative analyses are published:

	Sil. Man.		Carbon.		Phos. Sul.	
			Graph.	Com.		
Coltness.....	3.39	1.77	3.27	0.60	0.44	0.04
Glenarnock.....	2.53	2.13	2.69	0.85	0.54	0.04
Ohio softener.....	3.12	1.41	3.34	0.08	0.48	0.02
* Ohio softener.....	3.00	2.50	.....	.....	0.75	.....
Calumet.....	1.96	0.57	3.28	0.42	0.23	0.03
Chicago Scotch.....	3.33	0.60	3.215	0.288	0.316	0.03

* This is a very celebrated iron, the makers of which do not claim to use any blackband ores.

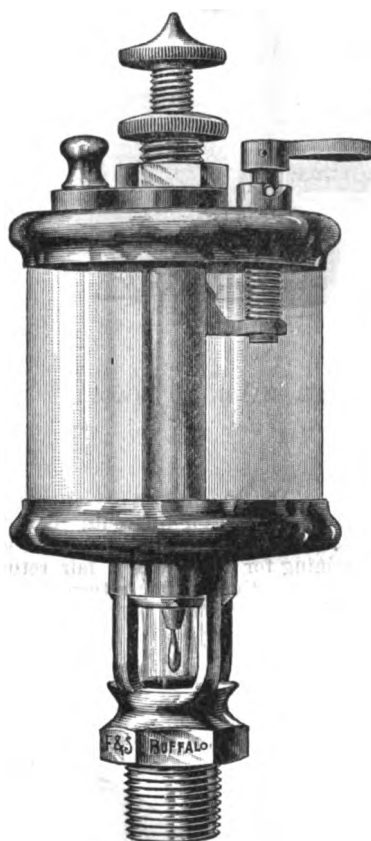
Messrs. Himrod & Co. point out the importance to foundrymen of the amount of silicon present in pig iron, and state that their Calumet iron is analyzed for silicon and carefully graded according to the proportion it contains, so that purchasers can depend upon securing a uniform iron. The document is well calculated to secure a lodgment in the minds of Northwestern foundrymen of a favorable impression concerning the irons now being made in their immediate vicinity.

Lloyd's Rules for Steel Vessels.—The committee and officials at Lloyd's Registry have again found it advisable to modify their rules in the light of further investigations, and accordingly they have this year issued new rules for steel vessels, and amended rules for iron vessels, which, on the whole, are considered to be more favorable for iron than they have been. Of course anything that lessens the difference between the thicknesses of iron and steel plates, while the prices of the two are so far apart, must tell in favor of iron. Thus iron manufacturers have better hopes regarding their prospects. The new rules, it may be mentioned, fill a quarto volume of 200 pages, there being included a large number of tables for iron and steel and full particulars of dimensions. They assign the limits of safe construction and

details of the strength and reliability of the different metals, their behavior under stress and strain, &c. It may be stated that these new rules provide that for iron of a thickness of a certain number of sixteenths of an inch—the difference being regulated by the size, &c., of the vessel to be built—a steel plate of so many twentieths of an inch may be considered an equivalent—e. g., a first garboard steel strake of $\frac{5}{16}$ inch is equivalent to an iron one of $\frac{1}{4}$ inch.

Buffalo Glass Oil-Cup.

With the increasing use of high-speed machinery, the problem of a thoroughly efficient and reliable means of supplying oil to the bearings becomes constantly more important and difficult. Not only



Four-Hole Eight-Drop Buffalo Glass Oil Cup.

is this demanded, but there must be economy in the use of oil. The oil-cup manufactured by Felthousen & Sherwood, of Buffalo, N. Y., and shown in the accompanying engraving, possesses new features of interest in connection with this question. It is of glass, with metallic base and cap. In the base are openings covered by glass lenses, through which the feed can be seen. The feed can be adjusted to suit requirements and fastened with a lock nut. It can then be started or stopped instantly by means of the lever, shown in the cut, without interfering in any way with the feed adjustment. The lenses on the sight drop can be easily taken out, cleaned and replaced, or new ones substituted if necessary. The cup is filled from the top, and has no loose parts to come off. If at any time it is desirable to flush the cup, it can be done by simply pulling up on the adjusting stem, when a stream of oil can be sent through it, this being accomplished without any change in the regular feed adjustment. These cups are made in four styles—two holes open, two holes protected by lenses, four holes open and four holes protected by lenses

A National Bankrupt Law.

The Committee on Bankrupt Law of the National Stove Association, consisting of W. P. Kellogg, E. W. Peck, A. J. Redway, E. G. Callahan, W. P. Warren, J. L. Smyser and W. H. Whitehead, made the following report, at the Chicago meeting:

Your committee appointed to prepare a resolution expressing the sense of this convention upon the question of a general bankrupt law beg leave to report: That in their judgment a uniform plan for the collection of debts, or more particularly for the collection and distribution of the assets of insolvents, is in its importance to the business community second only to that of a uniform currency. Laws uniform in their operation throughout the United States can only be passed by Congress, and Congress has no power to pass any such law, except under the power conferred by the Constitution to establish uniform laws upon the subject of bankruptcy. We all know the ease and frequency of preferences—by chattel mortgage, bill of sale or confidential indebtedness to relatives or others—that by rendering fraud easy, and escape from its punishment easier, put a premium upon dishonesty, the unsecured or unpreferred creditor having no redress.

It is by no means rare for a wholesale house to bolster the credit of a weak merchant, until others are induced to sell him, and then enforce a demand for payment or security by threat of proceedings for collection. We believe that an equitable bankrupt law is one by which it is impossible for a debtor to be discharged from the legal obligation of his debts without a full disclosure of his condition and a full surrender of his property. If a law provided that any confidential preference or any deception or concealment of property should prevent a discharge in bankruptcy, it would be an incentive to honesty and prove a safeguard both to debtor and creditor. Former bankrupt laws have been passed after periods of depression or of panic, when relief for large numbers seemed to justify a legal discharge from their obligations. What we now need is a measure of permanency, adapted to the current needs of business, that shall take the property of a debtor unable or unwilling to pay, and by a single process, at minimum cost, distribute the proceeds to his creditors.

One chief abuse that a bankrupt law should be framed to prevent is that of preferences. When they are given to creditors, it may be by connivance between debtor and creditor; that in itself amounts to fraud. When given to relatives or friends their effect is usually fraudulent, and they are often so intended from the first. The law should make them impossible, unless given openly and as a matter of record, and with a limit of time that is ample notification to creditors. We do not wish to discuss the question at length in this report, but, believing a general bankrupt law to be a measure that would have a salutary effect upon business, we hope for a free discussion of the question in convention, and would recommend the adoption of the following resolution:

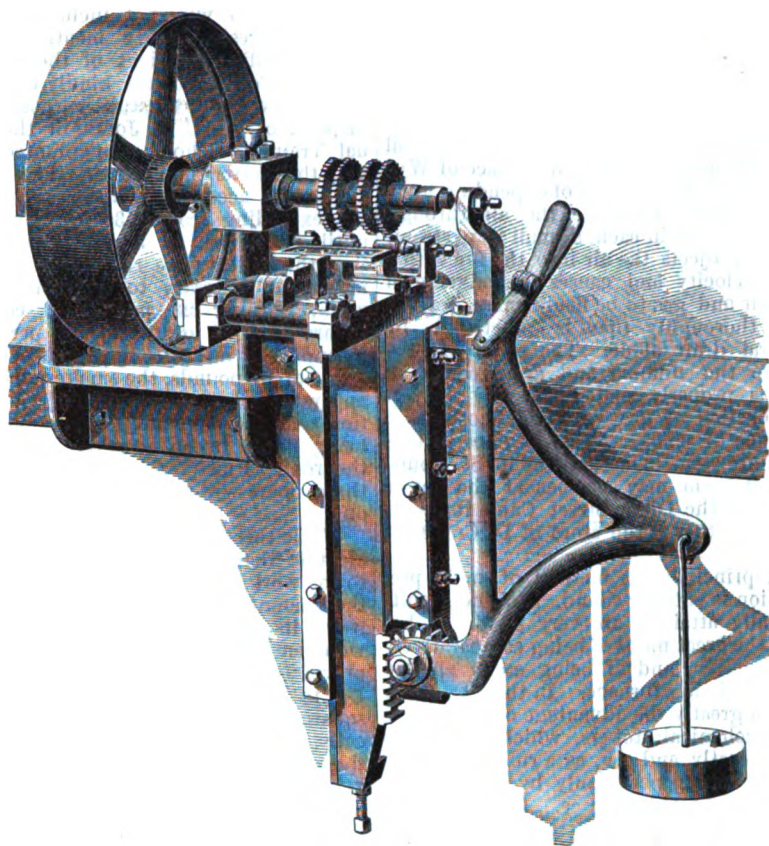
Resolved, That the early enactment of a general bankrupt law, to compel an unreserved showing and surrender of assets, to prevent unjust preferences, and to facilitate just settlement of the estates of insolvent debtors, as a permanent feature of our collection laws, is a much needed measure, and one that would benefit business alike in all sections.

Your committee further recommend that our secretary be instructed to officially communicate this action of our association to boards of trade and business men's associations in other cities and the press.

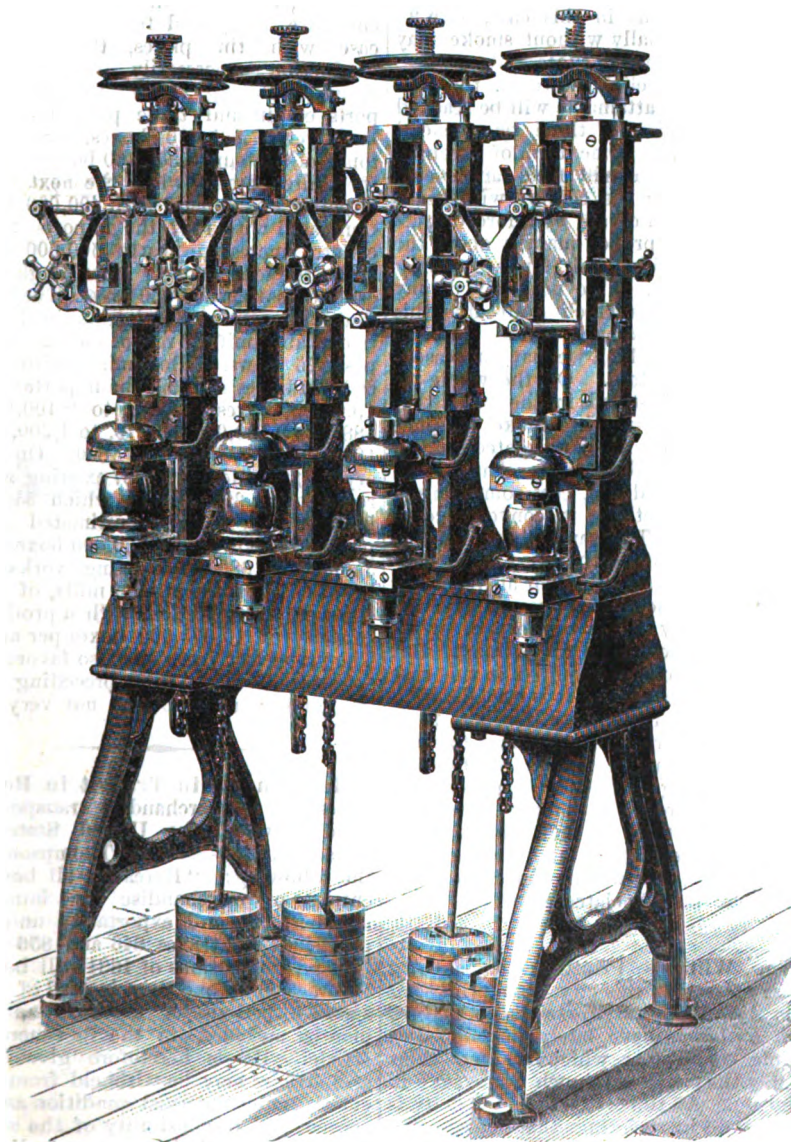
We also recommend a memorial to Congress from our association urging the passage of such a law, and that as individuals we urge it upon the attention of our respective representatives in Congress.

The Adt Butt Machinery.

The butt milling machine is for milling all kinds of cast butts, and is designed to be attached to an ordinary bench; the gang of mills is mounted on a horizontal steel spindle, and the work is fed up to it on a sliding table provided with a self-closing adjustable chuck; the table is raised and lowered by a rack and gear operated by a weighted lever, and the extent of its upward motion is regulated by a set-screw at the bottom of the slide. In operating the machine the butt is placed in position with one hand, while the other releases the spring catch and starts the lever; at the same time the chuck closes automatically and holds the butt firmly during the milling operation; when this is completed and the lever raised, the chuck opens and the butt is released. One operator can run two machines, and by matching the halves of the butts during the milling process detect any slight variation in the parts. It is claimed that this is the only method by which accurate work can be assured, as if one machine is used for both parts, especially on large lots, the mills may become dull before the first halves are finished, which will cause a variation in size, and by the time the second halves are finished there will be so much difference between the two parts that some of them will not match, and it will then be necessary to mill them over again or fit them by hand. In using a separate machine for each part, not only is much time saved in changing mills, but the butts are matched ready to commence



BUTT MILLING MACHINE, BUILT BY JOHN ADT & SON,
NEW HAVEN, CONN.



AUTOMATIC BUTT DRILLING MACHINE, BUILT BY JOHN ADT & SON,
NEW HAVEN, CONN.

drilling at once, and thus the two operations can be carried on together without the delay of waiting for the second half to be finished. A full outfit of butt milling and drilling machines should consist proportionately of one of the former to two of the latter.

Formerly the joints of butts were drilled on ordinary hand-lathes, and the only improvement made was in drilling by means of weights or a positive feed; but this method demanded the constant attention of the operator in order to prevent the drills heating or breaking. About 20 years ago the inventor of the machine here illustrated became convinced that both halves of butts could be drilled and matched together at one operation, and thereby avoid the constant watching required by the above method. To accomplish this he devised the plan of feeding by a screw and using a split nut arranged to open instantly whenever the drill became dull or struck a hard spot. This improvement forms one of the most important features of the automatic butt-drilling machine, and 20 years' use has demonstrated its advantages over all other methods. This machine is arranged with drills running in stationary bearings provided with convenient tubes for oiling, and protected from chips and dirt by bell-shaped guards attached to the spindles. The sliding carriage upon which the work is placed is fed toward the drills, and is started by closing a split nut on the feeding screw with a slight motion of a lever. When the proper depth is reached the lever comes in contact with a gauge on the side of the machine, which instantly opens the nut, and the carriage slides back by means of weights to its former position. As one boy can run ten machines, the most economical arrangement is to have them mounted in gangs of five and placed end to end. The cut shows four machines, which is the smallest number that can be recommended in one gang. The amount of work which can be done on these machines is equivalent to 1 inch per minute for each spindle on a medium-sized butt. The above machines are manufactured by John Adt & Son, New Haven, Conn.

Smoke Prevention.

In an address before the St. Louis Commercial Club, Robert Moore, C. E., speaking of smoke prevention in cities, referred to a class of devices in which small openings are made into the furnace above the coal precisely as in the Argand furnace of Wye Williams. But instead of depending upon natural draft to force the air through them, there is in each a small jet of steam, which projects the air into the fire with a high velocity and causes the mixture of hot air and gas to be made more quickly and thoroughly than is practicable by natural draft alone. The result of this, where the number and arrangement of jets is properly made, is a very perfect combustion of gas with an almost entire absence of smoke. Two devices of this kind are now in actual use in St. Louis. One of them may be seen at the power house of the Olive Street Cable Railway, and the other at the store of D. Crawford & Co.

In principle this method of smoke prevention is entirely sound, and the results actually attained are very good. It has also the great merit of being comparatively inexpensive, and of being easily applied to an existing furnace. In these respects it has greatly the advantage over the class of mechanical stokers, which are much more costly, and can, as a rule, be applied to an existing plant only by entire reconstruction to the furnace. It has also the further and very important advantage of admitting a higher rate of combustion than so far seems practicable by the other method, thus giving to the same set of boilers a greater working value.

This reduction of capacity has up to this time been the greatest obstacle of all to the introduction of smoke preventing furnaces. A very careful and very valuable series of tests of the actual working of such furnaces has been made by Professors White, Jones and Potter, of the Washington University, who have thereby done more than any other persons whom I know to convert the ordinary crude guesses upon this subject into exact and scientific knowledge. Their experiments, which have included the Backus, the Hall, the Jarvis, the Williams and the Murphy furnaces, have shown that by their use in such a manner as to be smokeless, the capacity of the steam plant as a whole is from a value of 100 per cent. given by the common smoke producing furnace brought down to 60, a reduction of 40 per cent. In other words, if with the common furnace burning coal without any regard to the amount of smoke produced it requires three boilers to make a given amount of steam, five boilers will be required to make the same amount of steam if a smokeless furnace be used. As steam boiler practice at St. Louis has always been largely governed by that of the river steamboats, on which it is of vital importance to make the needed steam with the smallest boiler possible, and as moreover many steam users are unable as well as unwilling to incur the increased outlay necessary for a smokeless plant, the introduction of these has until recently made little or no progress. Many have put in smoke burning devices, but finding they could not make the steam which their business demanded have taken them out and reverted to the old methods, which do indeed produce smoke, but do at the same time give them the power which they require. And unless some method is found by which this difficulty can be overcome, the prevention of smoke will be seriously embarrassed, as it will in practice be found to be a matter of much difficulty to compel steam users to make the larger investment of money which a smokeless plant will require.

In order to ascertain by an actual working test the performance in this respect of

the device in use at the Olive street power house, which was not included in the series of tests already mentioned, Mr. P. C. Maffit, president of the Missouri Railroad Company, very kindly consented to put the plant for this purpose at the disposal of Mr. C. E. Jones, of the Manual Training School, who volunteered to give the matter the necessary time. Such a test was accordingly made on October 18, extending from 7.30 in the morning until 11 o'clock at night. During this time the boilers were run first at the ordinary rate necessary to do their regular work, burning 23 pounds of coal per square foot of grate surface per hour; second at a rate of 32½ pounds; third at a rate of 27 pounds, the smoke-preventing apparatus being all this time in full operation and the amount of smoke produced being noted by an observer stationed on the roof. Finally the plant was run for three hours with the smoke burner shut off.

While these experiments were not sufficient to determine all the facts in regard to the working of the apparatus, notably the amount of steam required to operate it and its effect, if any, on the boiler, they were enough to show that simply as a preventer of smoke it has much merit. Up to a rate of 27 pounds of coal per square foot of grate surface it was practically smokeless. Beyond this rate of firing there was a good deal of smoke though very much less than with an ordinary furnace. Though in practice it is sometimes desirable, or even necessary, to push a furnace to a rate of 35 or even 40 pounds of coal per square foot of grate surface per hour, it is not common and ought perhaps never to be necessary. So that a furnace which will, as in this case, burn 27 pounds substantially without smoke may be considered as fairly successful.

I am of the belief, however, that the highest success attainable will be reached by a combination of these two general methods—viz., by some form of mechanical stoker which will feed larger coal than those now in use, coupled with means for the admission of air, by a forced draft if necessary, in proper quantity above the coal or at the bridge wall for the combustion of the gases. I do not know of any existing apparatus which quite fills this ideal, but I can see in it nothing impracticable, nothing which we may not reasonably hope to attain. On the whole we are, I think, justified in the belief that with proper efforts the smoke nuisance can even now be greatly mitigated, and in course of time substantially abated. To do this will, no doubt, cost something in money and something in convenience to the coal user. The same thing may be said, however, of nearly every other public nuisance. As a rule their abatement is attended with both trouble and expense and hardly any of the comforts of civilization are given to us for nothing. But even if the sacrifice required in this case were much greater than it is ever likely to be, it is no more than we have a right to ask, or even to require, the citizen to make to the comfort and well being of the community at large. And to help to form a public sentiment which will emphasize and enforce this demand, and without which the most stringent ordinance will be a nullity, is a worthy object both for individual and associated effort.

The Williams Printing Company, of Cherry street, in this city, who print *The Iron Age*, *The Metal Worker and Carpentry and Building*, have lately introduced a simple contrivance which removes thoroughly the source of much annoyance in printing. At times so much electricity is generated in printing that either the sheets cling together tenaciously or they show remarkable eccentricities in their

movements, suddenly shooting off from the delivery table for yards. At times this trouble has reached a point where work had to be stopped entirely. After experimenting unsuccessfully with a number of devices, the dissipator of L. E. Bathrick was tried. It did its work so well that it was applied to all of the eight large presses of the Williams Printing Company. Along the feed-table and under it is a long rod, from which is suspended a fringe of cloth saturated with a dissipating fluid, kept in contact with the delivery cylinder. Attached to it is a copper wire wound several times around the standard of the press. Its end is provided with bar, which is introduced between the delivery table and the sheet zinc covering of the latter. Even in damp weather a number of sparks can be observed in rapid succession when the bar is taken from its place and is made to approach the sheet zinc.

Some Tin-Plate Statistics.

The magnitude of the tin-plate industry is seldom fully realized by those outside of the trade, except when they chance to see some table of statistics. A single sheet of tin makes such a big showing for its weight that we are surprised to find the annual Welsh product running up to such large quantities. We also do not give full weight to the fact that this industry, the product of which goes all over the world, is practically centered in a single country. A similar product, sheet iron, for example, presents no remarkable statistics, for each country supplies its own demand; but when the demand of many countries is supplied from one, as is the case with tin plates, the tables of production necessarily contain large figures. During 1888 the total exports of tin and terne plates from England were 7,825,820 boxes, or 391,291 tons; of this sum 5,852,460 boxes came to the United States, while the next largest importer was Canada with 400,000 boxes. Compared with 1887 the imports to this country increased nearly 500,000 boxes, while the total exports from England increased less than 800,000 boxes. The United States imports of tin plates have shown a remarkably uniform rate of increase for the past 25 years. Beginning with about 600,000 boxes in 1863, the imports rose to 1,000,000 boxes in 1866, to 2,100,000 in 1867, to 3,100,000 in 1879, to 4,300,000 in 1882 and to 5,270,000 in 1888. On January 1, 1888, there were 87 existing works, representing 393 mills, of which 350 were in operation, with an estimated annual productive power of 9,130,000 boxes. On January 1, 1889, the existing works numbered 93, representing 444 mills, of which 403 were in operation, with a productive capacity of 10,075,000 boxes per annum. The prices last year were also favorable as compared with the three preceding years, though the advance was not very noteworthy.

Merchandise in Transit in Bond.

In respect of merchandise transported in bond between the United States and Canada, Acting-Secretary Thompson issued the following: "Hereafter all bonds on entries of merchandise for immediate transportation and exportation under the provisions of Articles 846 and 856 of the General Regulations of 1884 will be taken for a period of one year, instead of the respective periods of 60 days and four months specified in the first-mentioned article. Bonds heretofore given under said articles may be withheld from prosecution under the usual condition as to the consent and responsibility of the sureties for a period of time not exceeding one year from their respective dates.

Combination Friction Drill.

This tool is made for both taper and square shank drills, and is particularly adapted for machinists' use, where the different styles and sizes of drills are employed. The hexagonal top on the sleeve of this drill, to which the wrench is fitted, is an improvement over the hole and pin in making up the feed screw. In this drill, which is made by the F. F. Waters Mfg. Company, of 88 Oliver street, Boston, Mass., the well-known and certain friction clutch principle is employed. This construction results in doing away with almost all lost motion, as the drill can be operated with less than $\frac{1}{4}$ -inch backward thrust

fitters. A pin attached to the spring at each end holds the bit firmly in place. Fig. 3 is similar to Fig. 1, except that the end is round instead of hexagonal. The boiler drill, intended for working in contracted places, is shown in Fig. 5.

The Collins Furnace.

A correspondent of the *Bulletin* of the American Iron and Steel Association gives the following interesting information in regard to the above-named furnace:

The Collins Furnace, the new furnace of the Bellefontaine Furnace Company, at Bellefontaine, Pa., recently completed its

taken from the different banks of the company, and average from 49 to 53 per cent. of iron, 15 to 28 per cent. of silica, 0.08 to 0.16 per cent. of phosphorus, and from a trace to 0.03 or 0.04 per cent. of sulphur. They vary in appearance from a dark colored, often black hematite, with a pitch-like luster, rich in iron, to a lighter, liver-colored, compact hematite, not so rich. The ores are easily smelted in the furnace, and make an excellent quality of pig iron. They contain but few impurities, and it is this fact which made the charcoal irons of Centre County so famous in the past, and which is giving the coke iron now made from these ores a like good reputation. The ore from which the Bellefonte iron is made is taken from the banks which were opened and worked for the old charcoal furnaces. The coke used by the furnace is brought from the Connellsville region. The limestone used is quarried within 1500 feet of the furnace. A sample from the middle bed, the principal stratum worked, gives: Carbonate of lime, 98.322 per cent.; carbonate of magnesia, 1.170 per cent.; carbonate of iron and alumina, 0.320 per cent.; insoluble silicious matter, 0.390 per cent.

It may be interesting to furnacemen, at a time when their attention is being drawn to the South and other new regions, to observe the production and success of a new furnace in what was two years ago a practically undeveloped iron section, although, at the same time, one of the oldest iron-producing sections in the country. The increased power of the modern blowing engine and other improvements in furnace and mining practice have rendered valuable ores that were considered unavailable for the older furnaces, and which were left in the banks and on the screening floors by our old furnacemen.

La Grange Charcoal Pig.

The pig iron made in the charcoal furnaces of West Tennessee had a very high reputation for strength in the palmy days of that iron-making section before the war. Of recent years not so much has been heard of this iron, partly because of the greater development of the iron interests of other sections, and partly because the use of the iron has been mainly confined to a limited territory instead of covering a wide section of the Union, as of old. Attention has been freshly drawn to this matter through the publication by Rogers, Brown & Co., of Cincinnati and Chicago, of the results shown by comparative tests of strength made between the La Grange charcoal iron of West Tennessee and several leading brands of Lake Superior charcoal iron. The tests were made by a prominent manufacturer of agricultural implements, for his own information, and without the knowledge of the makers or their agents until the results were furnished them. Excellent as the Lake Superior irons proved themselves to be, the La Grange surpassed them. A 2-foot 1-inch square bar was broken in each case, the La Grange at 1500 pounds and the average of the Lake Superior irons at about 1200 pounds. This is a remarkable showing, in which the Tennessee iron manufacturers may well take pride.

A Chattanooga telegram says there has been consummated in that city one of the largest and most important real estate transactions in the history of the Central South. The Chattanooga Land, Coal, Iron and Railway Company, owning 25,000 acres of land on the north and west sides of the river opposite the city, embracing valuable coal deposits on Walden's Ridge, large iron ore mines and timber lands, have sold controlling interests to the Boston, New York and Philadelphia syndicate, the consideration exceeding \$1,000,-

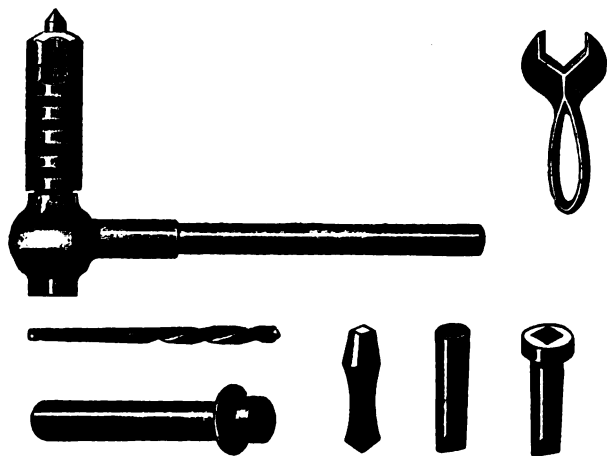


Fig. 1.

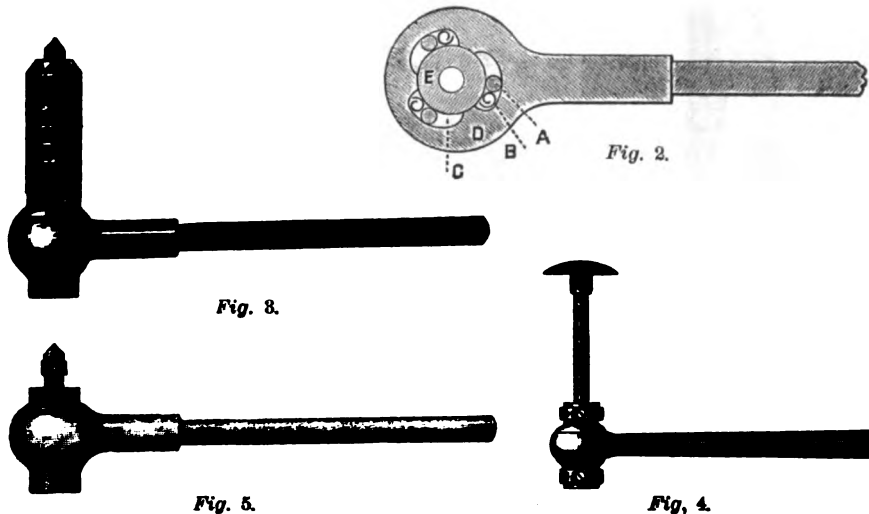


Fig. 2.

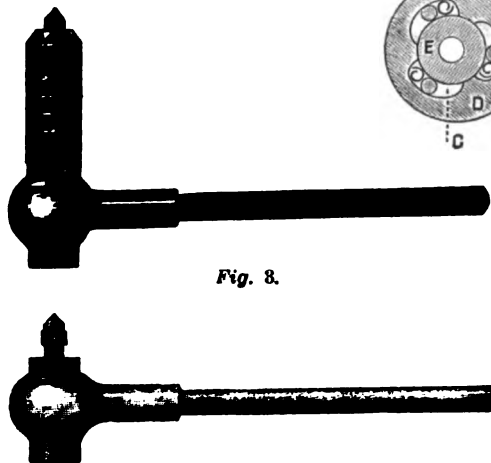


Fig. 3.



Fig. 4.

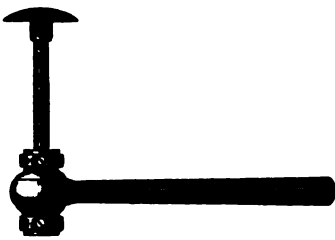


Fig. 5.

SMITH'S PATENT COMBINATION FRICTION DRILL.

of the outer end of the handle. This permits of the use of the drill in places so constructed that a drill having a considerable lost motion could not be employed. All the working parts—the body, cam, friction rolls, and feed-screw, which has a regular turned square thread—are of the best quality steel, drop-forged and tempered. The construction is shown in the lower drawing, Fig. 2. The letter E represents the body of the drill, around which the cam D revolves. The rolls A are held in place by the springs B. The opening C in the cam, into which the rolls and springs are placed, is broached out of this cam to a taper, so that whenever the handle is left the rolls will grip the body. The cam spaces are triplicated and arranged at equal distances apart, as shown. The auger friction bit stock shown in Fig. 4 is particularly adapted for the use of carpenters, machinists and gas-

first year's record, which was in every way satisfactory, 27,127 gross tons of pig iron having been made, an average of 81 gross tons for each day it was in blast. The furnace is 70 feet high, the bosh is 15 feet in diameter, and the crucible is 8 feet; the total capacity of the furnace is 72,000 cubic feet. The blast was put on on Tuesday, January 31, 1888, at 10.25 a. m., a little over nine months from the time work had been commenced on the foundation of the furnace, and the first cast was made on Wednesday, February 1, at 9 a. m. Since that time the only trouble of consequence experienced was caused by the wearing away of the in-wall at the stock-line, which was corrected by relaying the wall at that point with a harder brick.

The ores used are Centre County hematites, taken from the Buffalo Run and Barrens groups. The washed ores are

000, and the erection of an iron railway bridge across the Tennessee, the building of a railroad to the top of Walden's Ridge, and other extensive improvements will be begun immediately. The purchasers are headed by John W. Candler, a member-elect of the Fifty-first Congress from Boston.

The Osceola Company.

The annual report of this Lake Superior copper mine shows that the mining profit was \$142,076, of which \$22,907 was expended upon plant, leaving \$119,169 applicable to dividends. The dividend payments were \$150,000, showing failure to earn the same by \$30,831, instead of \$7924, as previously stated. This deficiency was charged to assets of \$235,516 at the beginning of the year, reducing them to \$204,685 January 1, 1889. The statistics of operations for the year were:

	1888.	1887.
Rock stamped, tons.....	183,036	145,200
Mineral, pounds.....	4,883,543	4,184,438
Refined copper, pounds.....	4,134,320	3,583,723
Copper per ton stamp rock, pounds.....	22.59	24.68
Refined copper per cubic fathom ground broken, pounds.....	35.9	377.15
Per cent. mineral in stamp rock.....	1.32	1.44
Per cent. refined copper in stamp rock.....	1.13	1.23
Cost per ton of rock hoisted.....	\$1.95	\$1.75
Cost per ton of rock stamped.....	2.21	2.05
Refined copper, cost at mine.....	9.78¢.	8.31¢.
Cost of smelting, freight and other expenses.....	1.83¢.	1.57¢.
Total cost per pound in New York.....	11.16¢.	9.88¢.

The chief cause of the high cost of refined copper, according to the report, was the reduced amount of refined copper per ton of rock, only 22.59 pounds against an average of 25 pounds for six years. The yield in December was 27.12 pounds, and the January yield will be as good. There was also necessary dead work done. Assets and liabilities January 1, 1889, were:

Assets.	
Cash in Boston.....	\$24,855
Cash at mine.....	1,383
Supplies.....	29,356
Fuel.....	12,812
Accounts receivable at mine.....	33,658
Accounts receivable in Boston.....	120,527
3000 shares T. & O. Mfg. Company...	15,000
250 shares H. and C. R.R. Company...	25,000
Copper since sold.....	39,549
Total.....	\$301,643

Liabilities.	
Drafts outstanding.....	\$28,435
Accounts payable at mine.....	37,414
Accounts payable in Boston.....	29,921
Dividends uncalled for.....	1,186
Total.....	\$96,950
Surplus assets.....	204,685
Grand total.....	\$301,643

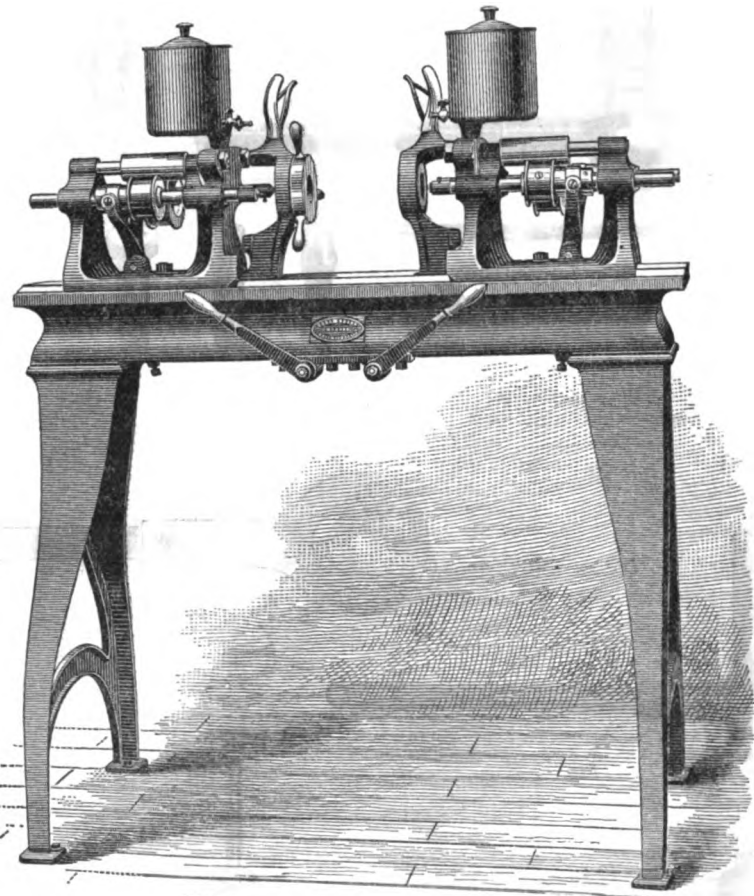
The following statement in the report will be of interest: "It is doubtless well known to our stockholders that this company, as well as nearly all of the other copper producers of the world, have sold their production of copper for about three years to 'La Societe Industrielle et Commerciale des Metaux de Paris,' at 13 cents per pound, and, in addition, such sums as shall be equal to one-half the net profits realized above this price on re-sales thereafter made of said copper. This sale, consummated April 20 last, expires December 31, 1890, and, as a guarantee, a letter of credit in favor of this company was opened by 'Comptoir d'Escompte de Paris,' with J. W. Seligman & Co., of New York, for \$520,000. Thirty days before May 1 next a similar letter of credit is to be furnished, and same is true of the year following. Up to this time this letter of credit has been

reduced to about \$410,000 by deliveries of copper unsold. On re-sales, of course, credits are not drawn against.

Double Center-Drilling and Counter-Sinking Machine.

The large number of turned bolts used in machinery, and the constantly growing demand for more accurate and uniform sizes, led Nicholson & Waterman, of Providence, R. I., to develop as a companion to their special bolt lathes the machine which we herewith illustrate. This tool performs the operation of center-drilling and counter-sinking both ends of bolts or rods at the same time. The nicety of turned work depends very materially upon the accuracy of counter-sinking, and while the opera-

prolongation of a line drawn from the center of the pivot stud through the center of the shafts are placed two hardened taper recess pieces, into which a tempered center is forced by a spring and is carried by the chuck frame and serves to locate the bolt in the center and in line for drilling. The two shafts are driven by one belt passing over an idler and over a drum pulley on the countershaft. The spindles are advanced by a handle in front of the machine, which is connected by crank and rod to a forked lever. The connection between the lever and the rod is adjustable to accommodate the different positions of the head. The chuck frame consists of a lower lug, through which the pivot stud passes, and which is provided at the upper end with a handle, to one side of which is attached a lever for re-



CENTER DRILLING AND COUNTER-SINKING MACHINE.—NICHOLSON & WATERMAN, PROVIDENCE, R. I.

tion of counter-drilling appears insignificant, yet the numerous handlings for drilling both ends become so considerable an item that very frequently they are omitted, and the center punch driven in with a hammer serves to make the seat for the lathe-centers. It was to perform these operations at one handling and accurately that the machine was designed. Contrary to the usual practice, the centering of the head is done from the sides of the head and not from the stock under the head. The end of the bolt is seized about an inch from the end, away from irregularities caused by shearing. In detail the machine consists of a bed upon which are placed two heads, which may be adjusted to any position to suit the length of the work. As they are duplicates, a description of one will cover both. The head carries a pivot stud a little below the level of the top of the bed and upon which the chuck frame swings. Above this, one on each side, are two sliding shafts, which carry respectively a drill and a countersink. At the

moving the centering pin when changing position. In line with the drilled shafts is placed a scroll chuck for one side (that of the end of the bolt) and interchangeable head holders for the head end. A separate holder is provided for each side of the head, and these holders are made tapering, the standard sizes being in the middle and the tapering allowing for variations in sizes. The depth of the countersink is regulated by the end of the countersink holder, which is tempered and brought against the work. For entering work the two chuck holders are brought forward against two lugs, the chuck being thus in line.

In practice, the operation consists in first placing the bolt in the two chucks, pressing the head end firmly into the holder and screwing down the chuck end. Next, grasping with both hands the two chucks and placing in line with drills, and then pressing down on the levers until sufficient depth of drilling is obtained, and advancing the chucks to the line of the countersinks, pressing the levers for

countersinking, and, finally, returning the chucks to the front of the machine for removing bolts.

THE WEEK.

The Nebraska State Farmers' Alliance estimate the amount of farm mortgages in that State as \$150,000,000, which, at 7 per cent., drains the State to the extent of \$10,500,000 per annum, and this is exclusive of corporate and municipal indebtedness. Artisans in consequence find the conditions of life harder, and manufacturers are compelled to narrow the margins of profit. Thus dealers and manufacturers are driven into the formation of trusts, "which seem pernicious and tyrannical."

Henry A. Gould, dealer in dyestuffs, rubber, gutta percha, &c., in Boston, under the firm name of Henry A. Gould & Co., made a voluntary assignment, with liabilities approaching \$1,000,000 and assets at present unknown. Mr. Gould has branch houses in Philadelphia, New York and London, and a purchasing house in Para, Brazil, the latter being the oldest American house in that city. He is said to have an interest in the reorganized National Rubber Company, the Brookhaven Rubber Shoe Company; also two camphor refineries, one of them at Rumney, N. H., and the other at Stamford, Conn., and is said to control the product of a German manufactory of anilines. About seven years ago the failure of the National Rubber Company, in which Mr. Gould was largely involved, seriously crippled his revenues. Other failures in the rubber trade last year brought further losses, which, report says, would have led to failure long ago but for the backing of Ezra Farnsworth.

Paper doors are said to be great improvements over wooden ones. They are formed of two thick paper boards, stamped and molded into panels and glazed together with glue and potash, and then rolled through heavy rollers. After being covered with a water-proof coating and one that is fire-proof, they are painted, varnished and hung in the usual way.

At the present juncture the views of Secretary Windom in regard to the silver dollar suddenly became of special interest. Referring to the Congressional debate of 1878, on the adoption of the Bland dollar, he expressly favored the remonetization of silver, but opposed the coining of a silver dollar that was not equal in value to a gold dollar. He said: "Several of the leading commercial nations have already adopted the gold dollar as the standard of value, and others are rapidly tending in that direction. If we are to compete for the commerce of the world, and to trade on equal terms with these nations, we must adopt a similar measure of values. Whether the instrument by which values shall be measured be gold or silver makes no difference in my judgment, providing the standards are alike. If, as assumed by the Senator's question, that great instrument of trade and commerce known as the dollar has no recognized value, and one thing may be called a dollar as properly as another, why waste 412½ grains? Why not call 206½ grains a dollar and have twice as many of them?" Mr. Windom finally voted for the Bland dollar, hoping for more favorable action when it became evident that the standard silver coin is deficient in intrinsic value.

Beginning on the first Monday in December, 1887, the Fiftyeth Congress continued practically uninterruptedly in session until the 20th of October, 1888, when it adjourned to meet for the second session in December and to continue until March 4, 1889, as required by law. During the

two sessions there have been introduced in the House 12,659 bills, or 1400 more than in the preceding Congress, and 268 joint resolutions, or five more than in the Forty-ninth Congress. Committee reports have been made to the number of 4154. In the Senate 3998 bills and 144 joint resolutions have been introduced, against 3357 bills and 118 resolutions during the Forty-ninth Congress, which broke all previous records in this respect. There were 2706 written reports made, or over 700 in excess of the preceding Congress. Of all these bills and joint resolutions 1791 became laws, of which number 1190 originated in the House and 601 in the Senate. The President also sent veto messages in the case of 99 House and 47 Senate bills, or 14 more vetoes than were made during the previous Congress.

Extensive coal veins underlie the city of Vancouver and crop out on either side.

Pittsburgh had a grand turnout of its skilled laborers on the 22d ult., comprising 10,892 men, nearly all of the Order of American Mechanics, escorted by 55 bands of music. The Catholic societies paraded at the same time and claim to have been as numerous, making 20,000 men in procession during the day.

An iron rooster, recently mounted on a new church steeple, in Brooklyn, was ignominiously taken down by order of the rector, Architect Waller failing to convince him that the "cock was an emblem of St. Peter," and, therefore, of fitting significance.

Estimates about to be submitted to the German Reichstag provide for an outlay of 21,882,570 marks, a large portion of which goes to strengthen the artillery. Of this total 9,390,266 marks will be raised by matricular assessments and 12,298,054 marks by an imperial loan.

Detroit is obtaining subscriptions for an international fair and exposition. Among the names secured are the Michican Stove Company, \$6000; Block Hardware Company, Bela Hubbard and Detroit Stove Works, each \$3000.

The Pennsylvania Railroad Company have purchased 435 feet of water front in Philadelphia at a cost of \$500,000, and rumor says the object is to accommodate a new steamship line.

The recall from Samoa of Herr Knappe, the German Consul, has been promptly followed by the dispatch of Herr Stuebel, formerly Consul General at Copenhagen, to replace him.

The competition of petroleum tank steamers at Philadelphia is making constant inroads upon shipping rates, affecting all classes of vessels. In the coal transportation business there is a similar depression equal to 20 per cent. to San Francisco and South American ports.

A fire-brick trust, capital \$15,000,000, is spoken of in England.

Mines in the Territories are the subject of a report by a Congressional Committee who state that there is invested in mining lands in the Territories by aliens about \$20,508,705, which has paid in dividends about \$4,737,800. The profits may have been greater than this, but certainly the original capital has been returned to the investors. The investment of foreign capital in the mines of the Territories before the passage of the act prohibiting such investments consisted in the purchase of patented claims. The purchasers usually paid a full consideration and frequently exorbitant prices for this property. The money they brought in helped to develop the country. The people of the Territories, the committee says, do not object to the investment of aliens' capital, but

rather invite it, and the committee thinks it would be as well if the law in relation to the matter were repealed.

No less than a dozen industrial and manufacturing companies are applying for the admission of their shares to dealings on the Stock Exchange.

The city of Spokane Falls, Wash. Ter., which has 15,000 inhabitants, was nine years ago the site of Indian wigwams. It is 400 miles east of Puget Sound on the Northern Pacific Railroad.

The assignee of the Pacific Guano Company reports the liabilities to be \$2,487,800; assets, \$422,284. The condition of Glidden & Curtis was stated as follows: Liabilities, \$2,266,836, of which \$424,400 is secured. The assets include items due from the Pacific Guano Company to the amount of \$1,777,757, face value; from the Ohio and Western Coal and Iron Company, cash and coupon account, \$571,421, face value.

A Detroit paper says the unjust action of the Canadian Government, through an "order in council," imposing an export duty of \$3 per 1000 feet on pine sawlogs coming to the United States, is not fully appreciated until the figures relating to the business are exhibited. The export of white pine logs to the United States was less than 5,000,000 feet in 1888, while over 20,000,000 feet of pine logs were imported by the Canadians, unburdened by either export or import duty, from the Lake of the Woods district of Minnesota, sawed into lumber at Rat Portage, and sold to the people of Manitoba. Most of the spruce cut on the upper St. Johns River in Maine is taken to Canada and manufactured into lumber at St. Johns, N. B. During the past ten years logs and masts to the value of over \$100,000,000 have been shipped from the United States to Canada free of duty, while less than \$20,000,000 worth have been exported from Canada to the United States. This shows the injustice of the Canadian export duty.

Accounts from Ogdensburg, N. Y., represent that very extensive smuggling is going on across the St. Lawrence River at various points, and urges that a steam launch should be employed as auxiliary to the revenue cutter, which can only navigate the channel.

The reactionary spirit of the new Emperor of China with reference to modern innovations is manifest in the opposition of the government to the extension of the Tien-tsin Railway. It is reported in a cable message received in London that the recent partial destruction of the Imperial palace is construed by the astrologers as an evil omen, intended as a warning against permitting the approach of the "Western invention" to the Sacred City; and it is said that the further extension of the railway has been prohibited by imperial decree.

The great lumber mills on Puget Sound shut down for eight days, owing to overproduction and a dull market in Southern California.

New York capitalists have subscribed \$17,000,000—\$8,000,000 in cash having been paid on account—for building two railroads through the immense coal fields and hardwood lands of Eastern Kentucky, to connect with the railroad system of Southwest Virginia.

Further information is given out in regard to the Peekskill Bridge Company's affairs, in which the management of the New York and New England Railroad Company are interested. Basing calculations upon the latest reports of the engineers, it is believed that within two years the bridge will be opened for business. The

work on the bridge structure has already begun, and is being carried on slowly on the site selected, preparatory to the construction of the piers. Of the latter there will be only two, one on either bank of the river. This will make the span one of the longest, if not the longest, in the East. Active work is now being done in several iron establishments preparing material for this span.

Congressman F. W. Ahearn, of Bay City, Mich., has purchased an extensive outfit for steel shipbuilding, and the keel for a steamer 280 feet long, to be fitted with the latest improved machinery, has already been laid.

The Pencoyd Iron Company are under contract with the Fifth Avenue Railroad Company, of Brooklyn, to go on with the construction of the road at the rate of 200 feet a day. Judge Barnard's recent decision, President F. Wilhelm says, removes all legal impediments.

Fully \$1,000,000,000 have been disbursed from the United States Treasury in the shape of pension money since the year 1861, and the new appropriation bill calls for \$84,000,000 more.

The Montezuma special Pullman vestibule train will shorten the time between the capital cities of the two Republics to a little more than 100 hours for a journey of nearly 3000 miles.

The Venezuelan Government has contracted for a large number of Italian laborers at the rate of \$23.08 per head, to be employed in the cultivation of ramie as a substitute for hemp, so extensively grown in Central America.

Cleveland, Ohio, builders are seriously considering the expediency of establishing a trade school in that city.

The great hall to be erected on the site of Madison Square Garden in this city will cost, with the site and equipment, \$2,400,000.

The disputed boundary between Alaska and Canada is described, in a report to the Government at Ottawa, as passing through the best gold bearing districts in the country, in the Yukon district.

The President of Honduras calls for more liberal appropriations in aid of bridge-building, wagon roads and steamship subsidies.

Artie B. Cleveland, president of the Cleveland Seed Company, in this city, is said to be a defaulter to the amount of \$150,000. Losses in Wall street are said to have caused the difficulty.

The report of Sir Julian Pauncefote's appointment as British Minister to the United States is confirmed.

William Beacham, president of the Julian Electric Company, in New York, which is running cars on the Fourth and Madison avenues, testified before a committee of the Massachusetts Legislature that it required six or seven hours to charge a battery; that the batteries in a car weigh 8400 pounds; that they contain sufficient electricity to last six hours; and that it costs 2 cents per car per mile to run cars in New York.

Preparations for opening the Paris Exposition are rapidly maturing. Commissioner-General Franklin and Assistant Commissioner-General Tuck will sail for France in April, and the final shipment of American exhibits will be made on the 9th and 16th inst.

Work at the Staten Island terminals, on wharves and piers, is advancing rapidly, and the three railroads interested in their completion are expected to cross the Kill von Kull bridge within three months.

MANUFACTURING.

Iron and Steel.

Marshall Furnace reports exceedingly satisfactory results since blowing in last month. The average make, prior to the remodeling of the plant by Frank C. Roberts, was 252 tons per week, whereas the present run of two successive weeks is 377 and 385 tons. The superintendent, Major Hiestand, states that he can easily make 400 tons per week. The furnace is the same size as formerly. The fuel consumption has also been reduced by over 500 pounds per ton of iron.

Dalzell & Fox, proprietors of the West Reading Boiler Works, at Reading, Pa., have received a contract to furnish the Ellis & Lessig Steel and Iron Company, Limited, of Pottstown Pa., with 12 steam boilers of 100 horse-power each and 12 stacks for the same.

Carnegie, Phipps & Co., Limited, of Pittsburgh, are shipping to the shipyards of Cramp & Sons, at Philadelphia, some of the largest armor plate ever made in this country. They have just turned out of their Homestead mill two plates which weighed in the aggregate nearly 19,000 pounds. They were 124 inches long by 90 inches in width and 3 inches thick. They weighed 120 pounds to the square foot, and their weight was 9300 pounds each. The plates have been sent to Philadelphia and will be put on one of the new Government cruisers.

The Standard Axle Company, of Wheeling W. Va., recently elected the following officers: John H. Hobbs, president; L. W. Phinney, secretary; A. D. Howe, manager, and Charles L. Hobbs, assistant manager.

At a recent meeting of the board of directors of the Bellaire Nail Works, of Bellaire, Ohio, the question of erecting an additional blast furnace was discussed, and it was decided not to take any action in the matter at present. It is understood that the present unfavorable condition of the iron market was the cause of this decision.

The directors of the Pennsylvania Steel Company met at the office of the company in Philadelphia on Tuesday, February 12, and elected the following officers: President, Luther S. Bent; vice-president and treasurer, Eben F. Barker; secretary, Edmund N. Smith; general manager, F. W. Wood; superintendent, E. C. Felton; assistant superintendent, H. H. Campbell. All of the gentlemen named have long been connected with the company. The changes that have been made in the official staff are all in the line of direct promotion.

Nos. 1 and 2 furnaces, of the Pennsylvania Steel Company, at Steelton, Pa., are idle, while Nos. 3 and 4 are in blast and making a good record.

Chess, Cook & Co., of Pittsburgh, have issued an execution against Graff, Bennett & Co., on an old judgment for \$14,727.75, of which \$7032.40 has been paid, leaving still due \$7695.35.

The Solid Steel Company, Alliance, Ohio, are fitting up separate works for turning out steel castings by the Mitis process. The building is completed and fully fitted for operation. One or two trial heats have already been made.

A press dispatch from Zanesville, Ohio, under date of the 1st inst., reads as follows: "Iron and steel men in this vicinity are much interested in a furnace for the use of fuel gas which has been reconstructed from a Siemens furnace by John H. McGrath, the melter at the steel plant of the Ohio Iron Company, of this city. The furnace was remodeled by cutting

down the chambers containing the checker work used to heat the air and gas before entering the furnace to about one-half the size of the old, and placing the ports from the chambers to the furnace side by side. No estimate as to the saving of coal can be given, as the gas is supplied from the same source as the steel-smelting furnace, but it is said that the consumption of coal is less than in a furnace in the same works built under the Smith patents. By the use of the Smith furnace 9 bushels of slack do the work of 13 bushels of lump coal, and the output is increased from 13 or 14 to 17 or 18 tons per 24 hours. The saving is reckoned at 40 cents on the ton." Of course we do not vouch for the correctness of the above, but give it for what it is worth.

At Pittsburgh, Thursday of last week, J. H. Bailey, assignee of Graff, Bennett & Co., entered suit against the Paulding Iron Company, Limited, for \$79,104.66. The suit is for use of James W. Friend, James M. Bailey and James Pickands, to whom the account was assigned.

At Pittsburgh on Friday, the 1st inst., Deputy United States Marshal Chambers sold at auction the property of C. M. Raymond in West Middlesex, Pa. The property consisted of ground, a rolling mill, chain works, brickyard, kiln, &c. The sale was on judgments on a mortgage held by L. G. Reed, E. A. Wheeler, First National Bank of Sharon and the Sharon National Bank. The concern was formerly known as the Wheeler Iron Company. The property was purchased by R. G. Browne, a broker, for \$8625.

The employees of the blast furnaces in the Mahoning Valley, Ohio, have accepted the reduction of 10 per cent. in wages, mention of which was made in our issue of the 21st ult. It is understood that the reduction will be restored as soon as the condition of the iron market warrants it.

The Chicago Forge and Bolt Company have taken a large contract for the construction of packets for the new ore docks to be built at Two Harbors, Minn., by the Duluth and Iron Range Railroad Company. Extensive preparations are being made by this company for next season's ore business.

The Allegheny Bessemer Steel Company, near Pittsburgh, were to roll their first steel rail on the 4th inst.

We were erroneously advised when we reported recently that P. J. McArdle, of Albany, N. Y., the purchaser of the Jagger property, desired to sell a part of it at a sacrifice. Mr. McArdle informs us that there are about 15 acres of land, with a blast furnace of about 25,000 tons annually. The dockage cost from \$100,000 to \$200,000 to build, and two railroads, the West Shore and the Delaware and Hudson Canal Company, run their cars into the yard. Two hoisting elevators on the dock make it possible to load and unload boats, cars running right to the dock. While on the Hudson River, close to the city of Albany, the property is in the town of Bethlehem, which avoids the city taxes.

Union Furnace, charcoal, of the Union Iron Company, Michigan, made 972 tons in February, with a fuel consumption of 1640 pounds or 82 bushels of charcoal per gross ton of pig iron, the furnace being equipped with cast-iron stoves.

A Chicago dispatch announces that F. T. Wheeler and Lucius S. Fisher, stockholders of the Pullman Iron and Steel Company, filed a bill in the Superior Court Monday asking for the appointment of a receiver for that concern. The company was formed in 1883 with a capital stock of \$500,000, of which \$250,000 was held in equal shares by Frank B. Felt and James P. Perkins,

who turned over to the company patents for making railroad spikes. The rest of the stock, they allege, was taken by George M. Pullman through his private secretary, John M. Smith, and by John W. Doane and others. A rolling mill was erected at Pullman by the company, the complainants allege, but the plant has not been a success. The company is now in debt to the amount of \$300,000, of which \$180,000 is owing to Pullman's Palace Car Company, which kept the iron and steel company running when it was in an insolvent condition. The assets of the company are about \$280,000, consisting mainly of the rolling mill plant.

A company has been organized at Detroit, Mich., to erect works for the manufacture of steel under the process controlled by J. W. Bookwalter. It will be known as the Michigan Steel Company. Press dispatches announce that the works are expected to be completed within three months, and that their output is to reach 150 tons per day.

Works are being built at Joliet, Ill., by the Parsons Railroad Crossing Protector, Switch and Frog Company. They will obtain their materials from the Joliet Steel Company, and expect to employ several hundred hands when in full operation. A switch is to be manufactured which automatically sets danger signals.

Machinery.

The Aetna Machine Company, of Warren, Ohio, recently received an order for two of M. V. Smith's gas furnaces and valves for the Beaver Falls Mills, of Carnegie, Phipps & Co., Limited, also an order for one of Smith's large gas furnaces and valves for the Chicago Horseshoe Company, of Chicago, Ill.

The Columbia Injector Company, Cleveland, Ohio, report an increased demand for their patent injectors. Among their recent sales is one No. 50, which, under 80 pounds of steam pressure, will throw 4000 gallons per hour, sold to the Wheeler Furnace Company, of Sharon, Pa., for their works at Middlesex, Pa., to furnish water for a boiler of 800 horse-power capacity.

Hooker-Colville Steam Pump Works, St. Louis, Mo., report a large increase in their February business over the same month of last year. They have just shipped to a concern in St. Paul, Minn., one of their largest size Hooker feed-water and purifier pumps.

Alfred Box & Co., of 812, 814 and 816 Green street, Philadelphia, have removed to their new works, at Front, Poplar and Canal streets, Philadelphia, where they have increased facilities to carry on their business. They report among their recent orders one of their extra large radial drills to the Union Bridge Company, which makes 22 drills supplied to this company within the last three years. Also an order for six radial drills for the Hilton Bridge Company, of Albany, N. Y., besides large orders from Europe and other places for their double screw hoist.

Morris, Tasker & Co., Philadelphia, Pa., are building a holder of 1,000,000 feet capacity for Philadelphia. They are also about to build for the city of Detroit a 750,000 double-lift holder.

Rohr Bros. & Co., of Harrisonburg, Va., wish the names of the manufacturers of the best ice machines.

During the past year the Buffalo Forge Company, of Buffalo, N. Y., have largely increased their line, adding many new sizes and designs, and greatly improving the construction and workmanship on the goods. All parts of the machines are made interchangeable, and, by the employment of special tools, templates,

presses, dies, &c., the machines have been improved and the cost of manufacture reduced.

J. H. Kase, of Danville, Pa., would like information about the material for making rope binders, cords, &c., and the necessary machinery for doing the work.

The Glamorgan Company, of Lynchburg, Va., ask for the address of manufacturers of compressed paper for making paper pulleys.

The successful bidders on contracts for cabling the West Side street railways of Chicago have just been announced. The Pennsylvania Iron Works, of Reading, Pa., will construct the Madison street power station; Fraser & Chalmers, of Chicago, will build the Milwaukee avenue power station; Robert Wetherill & Co., of Chester, Pa., will furnish the power to operate the loop running through the Washington street tunnel and the south division; Wright, Meysenburg & Co. will construct the cable road on Milwaukee avenue, and the Bullock Mfg. Company will supply the vault machinery. Wright, Meysenburg & Co. will sublet a contract for castings for the Milwaukee avenue road, and bids are now being received from foundrymen. About 4000 tons of yokes and other castings will be required.

F. R. Phillips, 407 Walnut street, Philadelphia, states that the demand for and sales of Post's zero metal for February are more than double any previous month. Mr. Phillips refers to its particular merits, such as durability in wear, coolness of journals under heavy pressure and high speed.

Hardware.

The Findlay Wire Nail Company, of Findlay, Ohio, have been reorganized. Mr. Putnam, of the Putnam Wire Nail Company, is president, and Fred. M. Strong, of Wheeling, W. Va., secretary. The litigation against A. L. Wetherald and his associates, who built the works, is supposed to have been amicably arranged in the reorganization.

A. E. Bronson, of Cleveland, Ohio, well known to the stove and hardware trade, has recently organized a company called the Bronson Supply Company, of which he is the general manager. The purpose of the company is to manufacture and control the sale of different specialties which will be sold largely to the hardware, stove and house-furnishing goods dealers. The address of the company is corner of Lake and Coe streets, Cleveland, Ohio.

Curtis & Curtis, Bridgeport, Conn., have shipped three pipe machines to be used in piping the Paris Exposition. They will also be exhibited there in the American department.

Standard Tool Company, Cleveland, Ohio, are this week moving into their new factory, but will endeavor to fill all orders as promptly as usual. They have greatly enlarged their works, and with their increased facilities will carry a very large stock of the goods they manufacture.

Vulcan Iron Company, Richmond, Va., have nearly completed their arrangements for the manufacture of heel bolts and grass rods, which are used largely in the cotton States. This is the last addition to their line of manufactures, and they expect to have a stock of these goods on hand by the 15th or 20th of the month.

The Syracuse Forging and Gun Company have found it necessary to remove their factory to more commodious buildings at Batavia, N. Y., where they have now nearly 20,000 feet of floor space, which they state is occupied by the best of modern machinery, thus offering facilities for manufacture which they did not enjoy in their former quarters. They re-

fer to Batavia, which is 35 miles east of Buffalo, as offering excellent shipping advantages, so that with their increased facilities they are in a position to give the best attention to orders. The manufacture of the new Baker gun will be under the personal supervision of W. H. Baker, and the output will probably exceed 6000 guns for the coming year.

With reference to the strike in the works of the Enterprise Mfg. Company, Philadelphia, Pa., we have the following advice from the president of the company:

As you are aware, we have a good foundry and have tried to use our men right, and this place is noted for paying high wages to its molders. They were earning a few years ago as high as \$32 and \$33 a week, but the organization to which they belong adopted a rule that they should not earn over \$4.10 a day. Then it was reduced to \$4, and then to \$3.90, where it remains at present; that is, a man must not earn over that amount, their argument being that he is apt to be cut down. Now, to commence our trouble: Some time ago we put two apprentices on, and the molders claimed that this was more than their organization permitted, their rule being one apprentice for every eight molders. I gave them to understand that I did not and would not recognize this, and claimed the right to put on as many as I thought was wise and proper. This was about two months ago. Since that time the molders have been working, as they call it, under protest. Last year we made a lawn mower, and the price for molding the driving-wheel we put at 4½ cents. This year we made another machine and put the price for molding the wheel at 4 cents, there being less work to mold the same and less iron to carry. The Grievance Committee took the matter in hand, and said it was too low and they would not permit it to be made. On this pattern a man can earn \$4 a day and not work extra hard. I gave the committee to understand that we did not intend to be dictated to, but did intend to run our own business, and that we did not recognize their right to interfere in the matter, adding that if the man who had that pattern did not desire to make it for that price he could quit, and they could quit one and all. The consequence was they left, and 11 apprentices followed in their footprints.

Notwithstanding the strike, the company have been running a heat every day, and have 12 hands at work molding, and expect to be able to turn out a fair amount of goods. They are determined not to yield, as they intend to conduct their business without such outside interference.

Miscellaneous.

It is reported by the *Waterbury American* that the sale of the extensive works of Brown & Bros. to Mr. Clowes, of the firm of Randolph & Clowes, has been consummated by the trustees of that property. Mr. Clowes admitted the fact, but was somewhat reticent as to the use he intended to make of it beyond providing facilities for his increasing trade. It is probable that the business will be extended to specialties in metals other than brass and copper, and that operations in steel and iron are contemplated; experiments have been conducted quietly for some time past, and success is no longer a matter of doubt. The old plant was built for a brass and copper rolling mill, and rumor has it that it may possibly be used for rolling copper again, as the price the present combination exacts for the special shapes in which Randolph & Clowes have to buy their copper for seamless house boilers is so great as seriously to hamper competition with makers who buy sheets as ordinarily rolled.

We have received a very attractive little book, treating of the iridium anti-friction metal made by Merchant & Co., of Philadelphia.

The new pumps for the Cleveland water works were tested last week and gave satisfaction. Their lifting capacity is 16,000,000 gallons per day. The engines are the largest ever built by the Knowles Company, and cost the city \$79,000.

The Iron Age

New York, Thursday, March 7, 1889.

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF, JR., - EDITOR.
GEO. W. COPE, - - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS, - - HARDWARE EDITOR.
JOHN S. KING, - - - BUSINESS MANAGER.

Commercial Relations With Canada.

During the past week action has been taken both at Washington and Ottawa intended to promote harmonious relations between the two Governments. At the same time the fact comes out incidentally that whatever views may be entertained by Sir Richard Cartwright, the Liberal leader in Canada, or by parties in the United States who may reciprocate the feeling in favor of commercial union, the Government of the Dominion as now constituted under Sir John Macdonald, the present Premier, will hold in scorn any measure, wherever originating, that contemplates a weakening of the ties that bind her to the British Empire. This appears in the defeat of a motion in the Ottawa Parliament, on February 26, which substantially embodied Mr. Cartwright's plea that Canada be permitted to negotiate her own treaties. The fact becomes still more obvious in the manifestation of feeling in response to the adoption of Mr. Hitt's resolution in the United States House of Representatives on the 1st inst.

The resolution provides that whenever it shall be certified to the President that the Government of Canada has declared a decree to establish commercial union with the United States, having a uniform revenue system, like internal tax to be collected and like import duties to be imposed on articles brought into either country from other nations, with no duties upon trade between the United States and Canada, he shall appoint three commissioners to meet those who may be designed to represent the Government of Canada to prepare a plan for the assimilation of the import duties and internal revenue taxes of the two countries, and an equitable division of receipts in a commercial union. The commissioners shall report to the President, who shall lay the report before Congress. The effect of the enactment of the resolution is to declare merely the disposition of this country to enter into a commercial union with Canada as soon as that country makes any advances. The scheme thus outlined becomes at once "a bone of contention" between the two parties represented in the Dominion Parliament, with no definite prospects for the future as concerns either one or the other. Sir Charles Tupper, since his return from England, emphatically denies the report of the intended retirement of Sir John Macdonald. Mr. Foster, the Minister of Finance, announces that the Government has decided to make no change in the existing customs tariff.

The annual reports of the different Lake Superior copper companies, which are coming in one by one, show pretty clearly what a particularly "good thing" to them has been the work of the French syndicate. Profits have been exceedingly hand-

some in spite of the fact that nearly every one of the mines has expended unusual amounts in improving equipment, bettering means of communication or enlarging capacity. The miners have taken care of themselves pretty well in their dealings with the French speculators, and probably their managers congratulate themselves on the brilliant results obtained. The future, however, will bring the day of fearful reckoning in the form of 8 and 9 cent copper, with dividends passed and a crop of assessments.

Placing the Wires Underground.

The ninth convention of the National Electric Light Association, held at Chicago, beginning February 19, was the most valuable yet held, as was evidenced by the character of the attendance, the standard of the papers presented and the lively interest manifested in many of the subjects treated. The most absorbing topic, and one in which the layman has a direct interest equal to that of the expert, was presented by the report of the committee on underground conduits and conductors. This committee was appointed at the previous convention "to examine into and report upon the systems of underground conduits, with underground conductors and conduits now in operation, and the number of wires actually in use in these conduits." The committee sent a circular letter to all the local electric light companies asking if they had ever placed underground any electric light conductors carrying currents at a potential of 1000 volts or over, and, if so, to state the results, giving the length of conductor, the voltage, the current in amperes, the make and style of dynamo, the kind of conductor, single or grouped in cables, size of conductor, thickness of insulation, maker of cable, whether cable was laid directly on the ground or in conduits, style of conduit, time of experiments and operation of cables, and, "if the cables failed to work satisfactorily, to which of the following causes do you attribute the difficulty: Defective insulation, defects in the joints, or defects in making connections from cables to lamps."

Of the 120 answers received by the committee only seven had had actual experience in placing and running underground electric wires, and of this number six were of the opinion that at the present time it was not practicable, either from an electrical, mechanical or commercial standpoint, to place the wires underground. This opinion was forced upon them principally because of the defective insulation of the wires, and next on account of defects in the conduits. The one favorable report was from a writer who had had his wires in conduits for about five years. The mains were carried through the streets in a composite system of conduits, and connections were made from the system to the cellars through iron pipes, and the wires were then conveyed through the cellars, connection being made from the cellars to the houses. The cellars run completely around the block, and permitted of access to them for the purpose of repairing or making connections to the wires. The report states that he considers the question of the distribution of power and light an exceedingly simple one in his city,

which is probably the only one that is so fortunately situated.

Of the remaining number of those who answered the circular 104 state that, basing their opinions upon tests they have made and seen and such information as they have been able to obtain both in this country and abroad, "it has not been practical to place the wires containing high tension electric arc-light currents underground." They consider that the question of obtaining a satisfactory conduit has not been solved, and that there is no "insulation for the wires that will not deteriorate within a few years and become perfectly useless as an insulator when subjected to the action of steam, water and gas." The difficulty of making connections for buildings and lamps, and the absence of an adequate system of subsidiary conduits, is considered as a bar to successful operation. A method of drawing in the cables, without injuring the insulation, is also needed.

The commercial side of the question is of vast importance, as the first cost is about eight times that of an overhead system, and as the repairs due to deterioration of insulation, and defects caused by mechanical and electrical imperfections, are very much heavier than in the aerial system. This would result in a necessary advance in the price of electric light as now furnished, in order to meet the increased expenses.

The circular was also sent to the electric underground wire companies, and in most of the responses received it was stated that, as they had very little or no experience with wires for that purpose, they were unable to give information. They had no doubt but that, having the demand, the conductor could be brought to meet the requirements.

The discussion of this report was long and entertaining, and, in a great measure, contradicted the conclusions drawn from the answers received. It was shown in several large cities underground electric conductors carrying currents at a potential of 1000 volts and over were in successful operation, both from an electrical and commercial standpoint. The trouble resulting from inferior insulation was not nearly so great as stated, this being shown by the fact that cables are now in service which were laid two or three years ago. The statement was also refuted by the manufacturers of cables, who offer to guarantee, by bond, the life of their insulation for three or four years. The mechanical drawbacks, although not as completely obliterated as desirable, are still so far under control as to present no insurmountable obstacle to the operation of the system; nor do they affect the commercial side by unduly increasing the repair account.

As the discussion of the report elicited more data regarding the actual condition of underground projects than were given in the report itself, and, as the opinions were from those who were in intimate relations with stations using underground conductors, and therefore had the requisite practical experience to render their opinions of value, the conclusion is drawn from the session, taken as a whole, that the placing of electric conductors underground is electrically, mechanically and commercially possible.

Russian and American Wheat Competition.

In consequence of the short wheat crop last year in the United States and the wild speculation in this staple in Chicago and New York it gave the pretext for Russia has been able to furnish England, out of an ample yield, amounts fully compensatory for the lessened receipts of wheat and flour from here. The total export of wheat from the United States last year did not exceed 49,581,915 bushels, as compared with 95,128,641 in 1887, while our flour export was restricted to 10,714,780 barrels, as against 12,181,810 in 1887.

The import of wheat and flour into England from all sources during the past three years has been as follows:

	Wheat, cwt.	Flour, cwt.	Equal to bushels.
1886.....	57,324,384	18,912,773	145,477,645
1887.....	55,784,686	18,066,545	145,403,576
1888.....	47,404,344	14,739,232	122,177,780

Russia, Roumania and Russian Poland exported to England the following amounts of wheat in bushels:

	Russia.	Rou- mania.	Russian Poland.	Totals.
1886....	8,925,378	541,796	2,460,365	9,927,679
1887....	10,800,176	1,062,659	2,896,578	14,759,413
1888....	39,888,414	2,648,948	6,004,322	48,541,684

From the foregoing figures it appears that the increase in the export from Eastern Europe to England between 1886 and 1888 amounted to 38,704,005 bushels. On the other hand, the United States and Canada furnished England the following amounts:

	United States.— Flour. Wheat.	Canada.— Wheat. Equal to
	Cwt. Cwt.	Cwt. bushels.
1886.....	11,478,182 29,621,728	3,080,864 77,936,181
1887.....	14,572,443 30,504,526	5,864,784 93,234,598
1888.....	12,597,086 14,547,185	1,039,080 57,899,650

On comparing the total shipments of wheat and flour in 1888 with the total in 1887 it will be found that there has been a decrease of 40,444,989 bushels. In other words, while this falling off in the supply from America occurred there was, as shown above, an increase of 38,704,005 bushels between 1886 and 1888 from Eastern Europe. This turning of the tables, of course, could not have taken place if the Eastern European crop had not been so abundant of late years and the quantity marketed so desirable. It shows the vigorous competition which our wheat and flour will have to encounter whenever there happens to be even a trifling shortage on this side. In consequence of the exaggerated bull speculation in Chicago and New York our exports are stopped for months.

Our export of flour to countries south of us has also severely suffered from a similar cause, especially shipments to Brazil, which have to compete with Hungarian shipped by steamers direct from Fiume and Trieste to Rio de Janeiro. During the first eleven months of last year the Hungarian flour shipments reached 1,533,583 barrels, the bulk of which went to Brazil, a country which received from the United States in 1887 748,937 barrels. Of course the abundance of the Austro-Hungarian wheat crop and comparatively low prices facilitated a large flour export to countries south of us from Hungary, whose magnificent steam flour mills turn out a quality of flour by no means inferior to our crack brands from Baltimore, St. Louis and Richmond, and which will keep in a tropical climate just as sweet as American. All this has occurred in a year when British India and Australia did not ship

to England any extraordinary amounts of wheat, as the following figures prove:

	British India, Australia.		
	Cwt.	Cwt.	Equal to cwt.
1886.....	11,028,665	738,699	21,965,746
1887.....	9,967,107	1,347,151	20,343,281
1888.....	8,423,155	2,315,700	20,045,863

The Indian railroad system is extending rapidly, there being in running order on March 31, 1888, 14,383 miles. During an abundant wheat crop year an extra stimulus may be given to exportation thence, now that the great wheat belt of British India is being tapped at more points than was formerly the case. It is to be hoped that a more copious wheat yield, combined with more moderate prices, may enable us to regain the superior foothold with our wheat and flour we partially lost in Europe and South America in 1888.

German Silver and Brass Scrap.

A matter which has received little attention from the metal trade at large is the question of the re-importation of German silver and brass scrap. It was brought before the Senate Finance Committee during the close of last year in a number of hearings to representatives of such firms as the Coe Brass Mfg. Company, of Torrington, Plume & Atwood Mfg. Company, Waterbury Brass Company, Benedict & Burnham Mfg. Company, Holmes, Booth & Haydens, Ansonia Brass and Copper Company, Osborne & Cheeseman Company, and the Seymour Mfg. Company, all of them located in the famous Naugatuck Valley. H. H. H. Wooster, of the last named concern, and Charles F. Brooker, of the first corporation, presented a petition in behalf of their associates and explained their views at length.

During the past few years American manufacturers of brass and German silver have been doing an increasing business with foreign countries, supplying makers there with sheet-metal for the manufacture of German silver tableware, show-case frames, and for cartridges. Their customers cut up the sheets in question, and according to the articles made therefrom from 80 to 60 per cent. of the metal so exported becomes scrap. Now, it is a custom, naturally growing out of the character of the business of the two parties to the transaction, that the rolling mill sells to the manufacturer with the understanding that it will take back, at a given price, the scrap produced in the process of cutting up. A seller who cannot undertake to go into such an arrangement is at a disadvantage, because the buyer prefers not to be troubled with the marketing of the scrap.

Now, our tariff imposes upon all German silver scrap a duty of 25 per cent. ad valorem, and upon brass scrap 1½ cents a pound. In the cost of German silver, according to the testimony of Mr. Wooster, this amounts to a minimum of 3 cents per pound on German silver scrap returned from Canada from a fork and spoon manufacturer, as much as 60 per cent. of the original metal returning. In other words, by reason of the duty on scrap returned, the American rolling mill is handicapped to the extent of 1.8 cent per pound on the original metal. But the matter goes even further still. When the American manufacturer uses foreign nickel—which he must do to a considerable extent, because

the American mine does not supply the demand—he is barred from obtaining a drawback on the nickel contents of the alloy. When the scrap returns to him he again pays a duty on the same article. In that case the aggregate duty on the metal that goes out again is figured at 4.08 cents by Mr. Wooster.

What the manufacturers of the Naugatuck Valley have pleaded for particularly, and what they seem justly entitled to, is that at least scrap from their own metal be allowed to enter free of duty, providing its identity can be satisfactorily established. They argue with much force that no American interest can suffer from such a system, but that its establishment will lift burdens imposed upon a foreign trade which can only benefit the country. The only serious objection raised by members of the Senate Committee—an objection which would naturally occur when the matter is presented—is that imports of scrap might be used to evade the payment of duty on constituents of the alloy. It was suggested that alleged scrap might be made to contain 50 per cent. of nickel, and the idea was even brought forward that the metal might be profitably separated from the alloy. In the case of nickel-copper-zinc alloys, this may at once be dismissed as impracticable. A high-grade alloy might, however, be used to make the ordinary grade by the simple addition of the necessary quantities of the baser metals. The Naugatuck Valley manufacturers framed the suggested paragraph in the free list, in the following manner, in order to meet the objection raised:

German silver scrap, containing not to exceed 25 per cent. nickel, made from German silver, the product of the United States, returned after having been exported, without having been advanced in value or improved in condition; but proof of the identity of such scrap shall be made under general regulations to be prescribed by the Secretary of the Treasury.

The manufacturers approached with more hesitation the question of dealing with a drawback, formulating the clause as follows:

There shall be allowed on all articles manufactured in part or materials imported, on which duties have been paid when exported, a drawback equal in amount to the duty once paid on such materials, and no more, to be ascertained under such rules and regulations as shall be prescribed by the Secretary of the Treasury. Ten per cent. on the amount of all drawbacks so allowed shall, however, be retained for the use of the United States by the collectors paying such drawbacks, respectively.

The evidence in regard to this suggestion is accompanied simply with this sentence: "It opens the door very wide, and so we have not much to say in favor of that clause." It would certainly be a somewhat difficult matter to extend the drawback system to single constituents of alloys used for manufacturing, but there seems to be a simple way out of the trouble, so far as the Naugatuck Valley manufacturers are concerned. Let them import all the copper, nickel and spelter used in making their German silver. This is being done with solder and there is no reason why it should not be done in the case of other alloys.

The pressure of work at the Government foundry at Washington is such that the construction of the main shafts for the new cruisers, Concord and Bennington, has been assigned to the Midvale Steel Com-

pany, and that firm are also turning out the steel forging for 12 new ordnance rifles of mark III, 6-inch pattern. The shafts are made of hammered steel and comprise 14 separate pieces. These pieces are sent in an unfinished condition to the West Point foundry, where they are turned down to the proper dimensions and bored out. The work will be finally completed about May 1, and the shafts will then be shipped direct from West Point to the Chester shipyard. The forgings for the rifles will be sent from the Midvale works to the Government foundry at Washington to be tempered, and from there half of them will go the West Point foundry and the rest to the South Boston Iron Works, at Boston, where the guns are to be constructed.

The Paris Universal Exposition.

GENERAL VIEW OF BUILDINGS.

The double-page plate which accompanies this week's issue of *The Iron Age* conveys a fair idea of the magnitude of the buildings. The view taken embraces the two series of structures on either side of the center line of the grounds, occupied at one end by the famous Eiffel tower and on the other end by the great machinery hall, the center line of which is placed at right angles to it. Neither of these structures is shown in our engraving, which, therefore, gives an idea of only two of the smaller buildings in course of construction.

PLANS OF THE BUILDINGS.

We are indebted to the *Génie Civil*, published in Paris, for the accompanying general plan of the buildings of the Universal Exposition, which is to be opened in a few months. The necessary reduction has made it impossible to enter in our drawing all the lettering. A reference to the following list, with accompanying numbers, will enable our readers to locate the principal buildings, countries and exhibitors. Beginning at the upper left-hand corner we have:

1. Panorama of the Transatlantic Steamship Company.
2. Agricultural Exposition.
3. International Petroleum Company.
4. Elevators: Thomas Powell and De Quilliac and Mounier.
5. Le Duc de Felico.
6. History of Habitation.
7. Champ de Mars Station.
8. Finland.
9. Norwegian Cottage.
10. Gas Company.
11. Swedish Cottage.
12. Printing and Office of Exhibition.
13. Aquarelles.
14. Pastels.
15. Monaco.
16. Foundations of Eiffel Tower.
17. Suez and Panama Canals.
18. Argentine Republic.
19. Mexico.
20. Customs.
21. Children's Hall.
22. Venezuela.
23. Bolivia.
24. Brazil.

Returning to the buildings along the Avenue de Labourdonnais we have:

25. Electric Station.
26. Forges du Nord.
27. Dillemont Company.
28. English Colonies.
29. Great Britain.
30. Belgium.
31. Société de Mariemont (collieries).
32. Denmark.
33. Holland.
34. The City of Paris.
35. Belgian Headquarters.
36. The Solvay Company (soda).
37. Cape Colony—The Kimberly Diamond Mines.
38. Fonderies et Forges de l'Homme (iron and steel).
39. Anciens Etablissements Cail (bridge builders, machinery and structural work).
40. Forges de St. Dennis (iron and steel).
41. Union Céramique Chauffournière Montchavise.

Near the Eiffel Tower are located also the following:

46. Folies Parisiennes (theatre).
47. Humfryes.
48. Restaurant.
49. State Manufactures.
50. Telephone Company.

On the other side of the tower there are, near the Avenue de Suffren:

51. Chili.
52. Nicaragua.
53. The Lota Company (Chili copper).
54. Salvador.
55. Valard & Cellard.
56. Uruguay.
57. San Domingo.
58. Uruguay.
59. Guatemala.
60. Liberal Arts.
61. Hayti.
62. India.

The following are in the Hall of Liberal Arts:

64. Restaurant.
65. Geography.
66. Cosmography.
67. Ministry of the Interior.
68. Foreign Countries.
69. Italy.
70. Switzerland.
71. United States.
72. Spain.
73. Portugal.
74. Roumania.
75. Norway.
76. Greece.
77. Life-Saving at Sea.
78. Servia.
79. Japan.
80. Siam.
81. China.
82. Roumania Restaurant.
83. Russian House.
84. Morocco.
85. Egyptian Bazar.
86. Egypt.
87. Persia.

Turning to that part of the principal hall for various groups which lies near the Avenue de Labourdonnais, we have the following countries:

89. Hungary.
90. Austria.
91. Jewelry.
92. Laces, &c.
93. Clothing.
94. Hats and Bonnets.
95. Silks.
96. Coaches.
97. Bleaching and Dyeing.
98. Camp Materials.
99. Chemical Products.
100. Forestry, Hunting and Fishing.

On the other side in the same building there are:

103. Silver Ware.
104. Ceramics.
105. Furniture.
106. Mosaics.
107. Russia.
108. Glassware.
109. Tapestry and Decorations.
110. Carpets.
111. Clocks and Watches.
112. Leather Goods.
113. Perfumery.
114. Stationery.
115. Art Castings.
116. Mining.
117. Bronzes.
118. Stoves and Heaters.

Between this hall and Machinery Hall are the following buildings.

118. Restaurant.
119. The Gramme Company (Electric).
120. Station of the Syndicate.
121. Lecounteux & Garnier.

At the end of the Avenue de Suffren we find, back of Machinery Hall:

122. Station.
123. Police.
124. Sulac and Fontaine boilers.
125. Megg, Echeverria, Boran lights.
126. Fives Lille and Pamtin boilers.
127. Bakers' ovens.
128. Belleville boilers.
129. Works of Ducommun.
130. Naeyer boilers.
131. Roser boilers.
132. Joyd & Pillé boilers.
133. Bakers' ovens.
134. Babcock & Wilcox boilers.
135. Restaurant.

Returning to the Hall of Liberal Arts we have:

136. Instruments of Precision.
137. Medicine and Surgery.
138. Holland.
139. Belgium.
140. Switzerland.

The position of the different countries in Machinery Hall is fixed only in a few cases. The United States have a relatively large space near one corner of the hall.

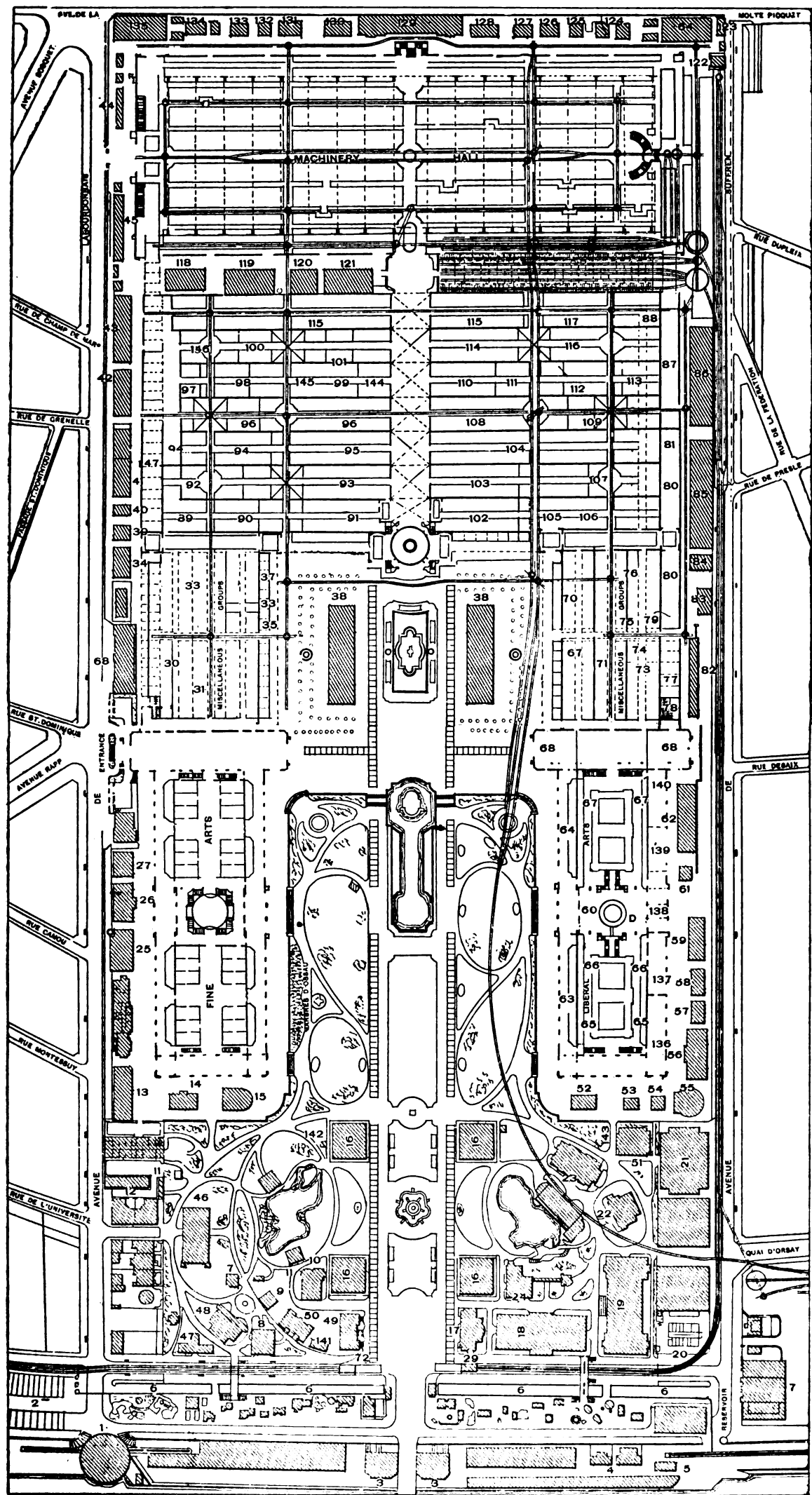
Among the corporations which have recently been authorized by the Secretary of State of Illinois, are the following: Rogers Siberian Iron and Tin Plate Company, Chicago; capital, \$200,000; to manufacture sheet iron and tin plates; William Rogers, W. E. Dustin, S. W. Adams and C. S. Radding. The Coleman White Lead Company, at Chicago; capital, \$200,000; for manufacturing; incorporators, G. D. Coleman, R. R. Bemiss and W. L. Dustin. Novelty Lock Company, Chicago; capital, \$200,000; to manufacture locks and light hardware; incorporators, W. A. Gardner, P. Hale and W. Rice. Walcott Mfg Company, Chicago; capital, \$100,000; to manufacture heat-traps and hardware; incorporators, A. Walcott, F. W. Childs and M. R. Diail. The Patton Motor Mfg Company, at Chicago; capital \$250,000; to manufacture and sell motors; incorporators, W. H. Dyrenforth, Charles E. Gaylord and J. W. Dyrenforth. The Energy Mfg Company, at Chicago; capital, \$10,000; for the manufacture of hardware and other patented articles; incorporators, William H. Fry, Daniel A. Ray and Charles O. Tillman.

The official report of the recent trial of the gunboat Yorktown, submitted to Secretary Whitney last week, shows that the vessel meets all the principal requirements of the contract, and that on the trial she developed 400 more horse-power than is called for by the contract, thereby entitling the contractors to a bonus of \$40,000, or at the rate of \$1000 for each horse-power in excess. It is probable that the vessel will be formally accepted by Secretary Whitney. None of the other vessels of the new navy, the construction of which was begun during Secretary Whitney's administration, is yet completed. Therefore, in case of its acceptance, the Yorktown will be more closely identified with the past administration than any of her sister ships.

At a meeting of the Youngstown (Ohio) committee of freight agents, held at Cleveland, Ohio, on the 27th ult., the following pig iron rates from the Mahoning Valley, Ohio, and the Shenango Valley, Pa., were made: Boston, \$4.20; New York, \$3.20; Albany, \$2.70; Rochester, \$1.95; Utica, \$2.60. The rates on limestone from the above named places were also equalized.

The sample ingot of aluminium exhibited at the meeting of the American Institute of Mining Engineers recently was not made by A. E. Hunt, of Pittsburgh, as stated, but was manufactured by the Magnesium and Aluminium Fabrik, of Bremen, Germany. Mr. Hunt informs us that the works with which he is connected are ready to furnish aluminium in any reasonable quantity, up to a ton, for immediate delivery. He disclaims, however, that he is the inventor of the process.

The contract for docks and trestles of the Central Dock and Terminal Company in Buffalo, has been awarded to W. F. Wentz, of Moreland, N. Y. The work will cost about \$800,000, and is for the handling of the Reading and other shipments of coal. Work will begin as soon as the weather permits, and is to be finished in one year.



PLAN OF THE PARIS EXPOSITION.

TRADE REPORT.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St. {
PHILADELPHIA, Pa., March 5, 1889. }

Pig Iron.—The market maintains a firm tone, although it cannot be said to have gained much within the past couple of weeks. There is a good demand, however, and the outlook indicates continued steadiness if not actual improvement. Good brands are readily placed at, say, \$15.50 for Gray Forge; \$16 @ \$16.50 for No. 2, and \$17.50 @ \$18 for No. 1, tide-water deliveries, or their equivalent. Occasional sales are reported at less money, but they are exceptional, and not fair representative transactions. A few specially favorite Irons command a premium on the highest quotations named, but they, too, are a little outside of the general market. As to the supply it is not by any means excessive. There are a good many sellers, it is true, and moderately large orders could be placed at quoted rates, although sellers are on the watch for an improvement, and have some degree of confidence that such an event is not improbable. Of course, no one looks for much change, but 25¢ to 50¢ per ton of an advance would be an important item in times like these. Hence, if the South and the West continue to report favorably, local furnaces would soon feel warranted in asking an advance, and perhaps with some degree of success. This feeling of itself proves that the market has turned. It is no longer a question of concessions from quoted rates, but rather as to how large an order should be taken, or whether an advance should be asked. This is undoubtedly the case to-day as regards the good brands, although it may take some little time yet to settle the matter satisfactorily. This market appears to be in a position to easily keep in line with the South and West, but it cannot improve unless they initiate a similar movement. It may be said, therefore, that the market is a waiting one, steady to firm at quoted rates, with a tendency toward improvement under anything like favorable developments.

Foreign Iron.—There is nothing doing at present, although asking rates are as before, viz., Bessemer, \$19.50 to \$20, c.i.f., duty paid. Spiegeleisen, \$28.25 @ \$28.50, c.i.f., duty paid, for 20 %.

Blooms.—A very considerable business has been done in Steel Slabs, Billets, &c., and in most cases at about the rates quoted for some time past. Sales include several thousand tons Nail Slabs at from \$29 to \$29.50, delivered at consumer's works, Sheet Iron Billets at \$30 @ \$31, delivered, and higher qualities for Boiler Plate, &c., all the way from \$34 to \$40, according to specification. Ordinary quotations are about as follows: \$28 @ \$28.50 at mill, for Nail Slabs; \$29 @ \$30 for Sheet Iron Billets; \$30 @ \$31 for Soft Tank, and \$35 @ \$36 for Flange purposes; Charcoal Blooms, \$52 @ \$54; Run-out Anthracite, \$41 @ \$42.50; Scrap Blooms, \$32 @ \$33 per "Bloom" ton of 2464 lb.

Muck Bars.—The market continues in a very unsettled condition, with all sorts of prices, and probably all sorts of Bars. Good, reliable qualities are offered at \$27 @ \$27.50, delivered, although as low as \$25.50 @ \$26, at mill, would be accepted for some qualities.

Bar Iron.—There is no improvement whatever. Large orders are not offered at present, either for Bars or Skelp, so that mills are either running on old contracts or on such small orders as can be picked up from day to day. Most of the mills are running single turn, and at the moment there is nothing in sight to encour-

age much hope of early improvement. Prices are necessarily very much unsettled, and while the best brands of Refined Bars are quoted at 1.80¢ @ 1.85¢, there is no scarcity of what the makers call "first-class Iron" at 1.70¢ @ 1.75¢. Skelp Iron is quoted at 1.75¢ for Grooved and 1.85 @ 1.90¢ for Sheared, but there is nothing of importance doing at present. The trade have been surprised to-day by a notice from the Reading Iron Works calling a meeting of creditors for Thursday. It is presumed that the assets will cover all liabilities, and that with an extension of time dollar for dollar will be paid, although, of course, it is all guesswork until after the meeting as above mentioned.

Plate and Tank Material.—In a general way the market is dull and without any definite prospect of immediate improvement. Some large orders for Steel Plates have been taken, but they are likely to be placed in the Western part of the State, so that local mills are not getting much advantage from that order (the new St. Louis Bridge). Still there is a great deal of local work going on, so that there ought to be a continuously heavy demand for Plates during the next three or four months. Large consumers, such as Ship, Bridge, Locomotive and Boiler works, are all busy, so that there should be a corresponding demand for materials. Meanwhile competition is sharp and prices irregular, although ordinarily quoted as follows: 1.90¢ @ 2¢ for Ordinary Plates and Tank Plates, 2.1¢ @ 2.2¢ for Universal Plates; Shell, 2.4¢ @ 2.5¢; Flange, 3.5¢; Fire-Box, 4¢; Steel Plates, Tank and Ship Plate, 2.1¢ @ 2.25¢; Shell, 2.7¢; Flange, 3¢ @ 3¼¢; Fire-Box, 3¼¢ @ 4¼¢.

Structural Material.—The general demand is slow and unsatisfactory, and large orders when placed on the market seem to be taken by mills at a distance. The material for the St. Louis Bridge (about 6000 tons of Steel) was placed a few days ago, but prices are said to have been extremely low, and only a portion of the order will be filled in this vicinity. Nominal quotations are about as follows: Bridge Plate, 2¢ @ 2.1¢; Angles, 1.95¢ @ 2.05¢; Tees, 2.4¢ @ 2.6¢; Beams and Channels, 2.8¢ for Iron or Steel.

Sheet Iron.—The demand for Light Sheet and specialties is good, considering the season. J. Wood & Bro.'s Heavy Sheet mill closed down last week, this department being very dull. Alan Wood Company are running both mills, having a fair line of orders for all of their departments. Prices as follows:

Best Refined, Nos. 26, 27 and 28....	3 @ 3¼¢
Best Refined, Nos. 18 to 25.....	2 @ 3 ¢
Common, ¼¢ less than the above.	
Best Bloom Sheets, Nos. 26 to 28....	4 @ 4¼¢
Best Bloom Sheets, Nos. 22 to 25....	3 @ 4 ¢
Best Bloom Sheets, Nos. 16 to 21....	3 @ 3¼¢
Blue Annealed.....	2½ @ 2½¢
Best Bloom, Galvanized, discount.....	65 %
Common, discount.....	67½ %

Steel Rails.—The market is not active by any means, but there is a feeling of confidence that promises better things in the near future. A good many small lots are being taken, and with upward of 600,000 tons already sold for this year's delivery, the outlook is decidedly more favorable than it was last year at this time. Prices are steady at \$27.50 @ \$28, at mill, with sales in accordance therewith.

Steel Crop Ends.—There is a good demand, but prices are a little too high to permit of business being done. English Basic Crops, \$22.50, with buyers at \$22, c.i.f., duty paid.

Old Rails.—There is very little doing in spot lots, holders being unwilling to meet the figures now attainable. Lots in store are held at \$24 and upward, and shipments at \$23.50, but sales are chiefly

in small lots delivered along the line of roads at from \$24 to \$24.25, according to circumstances.

Scrap Iron.—In good demand at from \$20.50 to \$21 for cargo lots, with sellers at about the following quotations: \$20.50 @ \$21 for cargo lots; \$21 @ \$21.50 for car-load lots, delivered, or for choice \$22; No. 2 do., \$14 @ \$15; Turnings, \$18 @ \$14; Old Steel Rails, \$20 @ \$21; Cast Scrap, \$15 @ \$16; do. Borings, \$9 @ \$10; Old Fish Plates, \$23 @ \$24; Old Car-Wheels, \$17 @ \$18, Philadelphia.

Wrought-Iron Pipe.—Business is very dull, and, while discounts are nominally unchanged, they are liable to be sharply cut on offers for large lots. Nominal discounts are as follows: Butt-Welded Black, 55 %; Lap-Welded Black, 65 %; Butt-Welded Galvanized, 45 %; Lap-Welded Galvanized, 55 %; Boiler Tubes, 62½ %.

Nails.—Dull, weak and irregular. Prices hard to quote, although store prices for best makes remain at from \$1.90 to \$2, with the usual rebate on car-load lots.

The partnership between Mr. Wm. R. Hart and Mr. George T. Barns, under the firm name of Wm. R. Hart & Co., terminated on March 1. Mr. Hart will continue business on his own account at the former address under the same title as before, while Mr. Barns will have his office at 312 Walnut street, and do business under the firm name of George T. Barns & Co.

Pittsburgh.

Office of *The Iron Age*, 77 Fourth Ave. {
PITTSBURGH, March 5, 1889. }

Prices continue unsettled and unsatisfactory, but with an improved demand better prices will follow. There has been a largely increased business in Pig Iron during the past week, a considerable portion of which was at an advance of 25¢ per ton. Very large shipments of glassware have been made recently by river, and Gray's Iron Line will get out a couple of tows this week, chiefly of Rails; one of these will go through to New Orleans. One of the Gray boats can take a cargo of 4000 tons. The outlook for our manufacturers is generally favorable, and in some lines there is now a fairly good business. The river Coal trade continues in a most unsatisfactory condition, and the outlook for an improvement soon is not very encouraging. Southern Coal is becoming a formidable competitor to Pittsburgh Coal in Southern markets. At New Orleans, the largest distributing point in the South, the prices scarcely cover lay-down cost from Pittsburgh. Some 6,000,000 or 7,000,000 bushels will be started down the river within the next day or two, a considerable proportion of which goes through to New Orleans.

Pig Iron.—The demand continues to increase; consumers who would not a week ago buy a ton beyond their immediate necessities are now anxious to anticipate future wants, as some have done, and that, too, at an advance of 25¢ on the prices of a week ago, when there were plenty of sellers and scarcely any buyers, whereas it is now the other way, the tables having been turned, as the former outnumber the latter. There is no boom, nor is such a thing desired, but there is a largely increased volume of legitimate business and a very much stronger market. A number of sales of Mill Iron were reported at an advance of 25¢, and Bessemer is also stiff at an advance of from 25¢ to 50¢ per ton. We now quote as follows:

Gray Forge Neutral.....	\$14.25 @ \$14.50, cash
All Ore Mill.....	15.50 @ 16.00, "
White and Mottled.....	13.50 @ 14.00, "
No. 1 Foundry.....	16.00 @ 16.50, "

No. 2 Foundry.....	15.25 @ 15.50.	"
No. 2 Charcoal Foundry....	21.50 @ 22.50.	"
No. 1 Charcoal Foundry....	22.50 @ 24.00.	"
Cold Blast Charcoal.....	25.00 @ 27.00.	"
Bessemer Iron.....	16.50 @ 16.75.	"

Muck Bar.—There is some inquiry for future delivery at about \$27 @ \$27.25, cash, but while it can be bought for immediate delivery at the prices quoted, sellers are not disposed to contract ahead, indicating that they look for a better market in the near future and intend to keep themselves in position to take advantage of the same. A large buyer who has been on the market for some days past reports having found but few sellers who were willing to contract ahead.

Spiegel.—Spiegel is quoted at \$28.50 @ \$29 for 20 %. Ferro-manganese is firmer, with an increasing demand; is quoted at \$56.50 @ \$57 for 80 %.

Manufactured Iron.—There is an increasing demand, but trade is far from being active; however, now that the raw article has stiffened, we may look for orders to come forward more freely, as the high demand has been caused by a disposition on the part of buyers to hold back until there was some assurance that hard pan had been reached. Moreover, from the fact that both jobbers and large consumers have been holding off as stated, it is evident that, as a rule, they are low in stock, which will have to be replenished. Prices for first quality Iron quoted at 1.70¢ @ 1.75¢ for Bars, 2.10 @ 2.20¢ for Plates, 2.70¢ @ 2.80¢ for No. 24 Sheet. Skelp Iron, 1.60¢ @ 1.65¢ for Grooved, and 1.90¢ @ 1.95¢ for Sheared—all 60 days, 2 % off for cash.

Nails.—There is no improvement in the Nail trade. In this market the trade is very dull for this season of the year, and there does not appear to be much prospect of an early change for the better. Pittsburgh manufacturers refuse to sell below Pittsburgh card rates—\$1.90, 60 days, 2 % off for cash—but buyers can do better elsewhere.

Wrought-Iron Pipe.—There is more inquiry, and it is expected that there will be a considerably increased volume of business as soon as the fine weather opens up, so that outdoor work can be prosecuted with some degree of satisfaction. The market, however, continues in an unsettled and unsatisfactory condition. We quote discounts for large lines: Black Butt-Welded Pipe, 57½ and 5 %; Galvanized do., 55 %; Black Lap-Welded, 67½ and 5 %; Galvanized do., 57½ %; 2-inch Tubing, 11¢ ¾ foot net; ¾-inch Casing, 85¢ ¾ foot; Boiler Tubes, 65 % off regular list.

Old Rails.—There is more inquiry reported, but no recent sales, in the absence of which we quote nominally at \$23 @ \$23.50, cash. It is expected that the mills in the Shenango and Mahoning valleys will be on the market before long, and, if so, a largely increased volume of business may be looked for. Sellers here have hopes of better prices as soon as the busy season opens up. Old Steel Rails in the absence of sales may be quoted at \$17.50 @ \$18 for short and \$19.50 @ \$20 for long lengths.

Steel Rails.—Heavy Sections are still quoted at \$28 @ \$28.50, cash, at mill, for small lots, but large lots, it is said, have been booked here as low as \$26. The rail mill of the Allegheny Bessemer Company is about ready to start up on rails; it has been making Ingots for some weeks past. This company have several large contracts, booked some time ago.

Billets, &c.—Bessemer Steel Blooms and Billets remain about as last quoted, \$27.50 @ \$28, with a light demand. Domestic Bloom Ends nominal at \$17.50 @ 18, and Rail Crops at \$18 @ 18.50.

Railway Track Supplies.—There is no change to note in prices. Spikes, 2.10¢, 30 days; Splice Bars, 1.70¢ @ 1.80¢; Track Bolts, 2.75¢ with Square and 2.85¢ with Hexagon Nuts.

Merchant Steel.—Trade fair; prices unchanged. Best brands Tool Steel, 8½¢ ½ lb; Crucible Spring, 4½¢; Crucible Machinery, 5¢; Open Hearth do., 2½¢.

Old Material.—The demand continues rather light, while prices remain unchanged. No. 1 Wrought Scrap, \$20 @ \$20.50, net ton; Wrought Turnings, \$18 @ \$18.50; Car Axles, \$24.50 @ \$25; Cast Scrap, \$14.50 @ \$15, gross; Cast Borings, \$11 @ \$12; Old Car-Wheels, \$19.

Cleveland.

CLEVELAND, March 4, 1889.

Iron Ore.—The furnacemen are making liberal inquiries for new Ore, but prices remain unfixed. A large consumer writing during the week for 15,000 tons of Chapin Ore, May delivery, received an offer of the lot at \$5.15 ¾ ton. At the office of the Chapin Mining Company it is intimated that opening prices will be fixed at \$5.10 @ \$5.20. About 3000 tons of this Ore on the dock was sold during the past week at \$5.25 ¾ ton, for immediate delivery. At the headquarters of the Republic and Champion companies \$5.85 @ \$6 are talked of for opening figures. There is every prospect of heavy sales of Gogebic Bessemer early in the season, at prices varying from \$5.10 to \$5.25. The improvement in the Pig Iron situation has materially strengthened the Ore market, and negotiations are known to be pending for several round lots of new Ore at prices from 20¢ to 50¢ in advance of last season's opening prices, and not far from 25¢ below the prices prevailing at the close of navigation, 1888. The formality of fixing prices for high grade Bessemer Ores is likely to be delayed until the upward movement in the Bessemer Pig Iron market has reached its limit. If prices for the latter commodity continue to improve, the first sales of No. 1 Specular and Magnetic Bessemer Ores will likely be made at \$6 ¾ ton. The situation is, therefore, at present one of active inquiry on the part of buyers and of a high degree of confidence among the mine owners and agents. The vessel men have proven by careful calculations that the average price paid for bringing Ore from Ashland to lower lake ports last season was \$1.46 ¾ ton. Estimating from this basis, they are claiming \$1.45, and possibly \$1.50 as the probable season rate from the head of Lake Superior, with a probable rate of \$1.85 from Marquette and \$1.20 from Escanaba. Permanent carrying rates are, however, likely to be fixed about 10¢ ¾ ton less than is now claimed by the vessel owners. There is practically no unsold Ore on the docks, while about 20,000 tons, already sold, have been sent to the furnaces. An interior furnaceman consented during the week to accept 5000 tons of new Ore, delivered in May, in place of the same quantity purchased last season and now lying on the docks. The old Ore, a non-Bessemer grade, was promptly disposed of at \$4.10 ¾ ton, which amount seems likely to be fixed upon as an average quotation for non-Bessemer Ores for the coming season.

Pig Iron.—Bessemer Irons have sold during the week at \$1 advance over December and January prices. The market is firmer in every particular and better prices are readily obtained for all grades of Iron. There has been a liberal increase in sales, and the aggregate amount of Iron disposed of last week was largely in excess of the record for any single week since December. A local dealer who sold 500 tons of Mill Iron at \$14.50 during the

recent depression promptly declined an offer for a similar amount on Saturday. Buyers seem ready to anticipate their requirements for the next three months and are buying accordingly.

Old Rails.—The market is dull, with scattering sales of Old Americans reported at \$21 @ \$21.25.

Birmingham.

Office of *The Iron Age*,
Twenty-first street and Second avenue,
BIRMINGHAM, March 4, 1889.

There is no notable change in the Iron market here. There has not been much selling lately. Furnaces are now piling up stock in the belief and confident expectation of better prices. Nothing of consequence has been sold for the last two weeks in the district. No. 2 Foundry may be quoted at \$12.25 at the furnace. Operations have gone on smoothly since the last report. There has been no break in a steady increase of the output of new material mined or manufactured in the district. The financial situation continues hopeful. There has been a considerable disposition among capitalists operating hereabouts to get hold of choice parcels of mineral property, and much money has recently changed hands in this respect. While recognizing the great resources in Coal, Iron Ore and Limestone which this district possesses, the builders of furnaces until only recently have been somewhat cramped for raw material. Many of them have gone ahead and built furnaces without being assuredly provided with Ore, fuel or fluxing material. The furnaces about Birmingham, however, are just now well up to living business methods, and there is no doubt they are on a solid, healthful basis, which is bound to be productive of general good results. Foundries and machine shops still keep busy. Disposition of rolling mill products is slow, with nothing distinctly promising, although there is a sympathetic hope with Pig-Iron makers of better prices. Much is looked for in the near future from careful experiments with Alabama Ores for Steel-making, and those who have most concerned themselves in the development appear sanguine.

St. Louis.

OFFICE OF *The Iron Age*, 212 N. Sixth st.,
ST. LOUIS, March 4, 1889.

Pig Iron.—There is some slight improvement noticeable in the general tone of the market. During the past week a number of sales of Gray Forge were made, from 500 to 1500 tons, at about prices as quoted herewith, and in some cases a trifle more was paid. Furnaces seem determined to maintain prices, and are refusing to sell at the low figures that have been prevailing for some time. They have confidence in the market and are disposed to look for higher prices when the orders already booked are filled, and are refusing orders for delivery during the year, even at slightly advanced figures. Prices can therefore be quoted steady to firm at about as follows for cash, f. o. b. St. Louis:

Southern Coke, No. 1 Foundry,	\$15.25 @ \$15.75
Southern Coke, No. 2 Foundry,	15.00 @ 15.25
Southern Coke, No. 3 Foundry,	14.25 @ 14.75
Gray Forge.....	13.50 @ 13.75
Ohio Softeners.....	17.50 @ 20.00
Lake Superior Charcoal.....	21.00 @ 21.50

Charcoal Foundry, No. 1.....	16.00 @ 16.50
Charcoal Foundry, No. 2.....	15.00 @ 15.50

Charcoal Foundry, No. 1.....	17.50 @ 18.50
Charcoal Foundry, No. 2.....	16.75 @ 17.50
Connellsville Coke, f.o.b. East St. Louis,	\$4.70; St. Louis, \$4.85.

Bar Iron.—There is no change in this department except the lowering of store

price from \$1.80 to \$1.85, which went into effect on the 1st inst. Business continues in the same channel as last reported, and sales are generally for small lots for quick delivery at from \$1.75 to \$1.85, according to quality, &c.

Barb Wire.—There is nothing of interest to report in this connection. Business keeps up fairly well, and some of the mills are well filled with orders. Others, however, show no disposition to "drum up" trade, and are filling what orders they receive, but looking for nothing outside, as they claim they are now selling at cost and prefer to wait until the market shows some signs of strength before taking orders for spring delivery. It is difficult to give a correct quotation, as each manufacturer makes his own price, in some cases higher, in others lower, than those quoted below: For carload lots Two and Four Point Painted, \$2.90; carload lots Two and Four Point Galvanized, \$3.50, f.o.b. St. Louis; less than carload lots, 5¢ additional.

A. P. De Camp & Co., Laclede Building, St. Louis, Mo., are exclusive agents in that district for Midland Missouri Charcoal Iron, also for Natural Lake Superior Charcoal, and Dexter and Struthers' brands of Ohio Scotch and Blackband Irons.

Chicago.

Office of *The Iron Age*, 85 and 97 Washington street, CHICAGO, March 4, 1889.

Pig Iron.—A considerable quantity of Iron was sold in this market during the past week, but the volume of business was by no means as large as that of a fortnight since. Other deals are pending, and it looks as though much more Iron would be absorbed by consumers before the absolute dullness sets in, which is being freely predicted as a result of the very great activity in February. Ohio and Southern Irons have been purchased most freely of late, as consumers had pretty generally covered their requirements for Strong Irons. Prices still rule very low, as notwithstanding the withdrawal of numerous sellers from the market, and the advance of 25¢ @ 50¢ per ton by others, a remnant is left willing to sell at the old figures. No. 2 Soft Southern has been placed at \$14.25, cash, and it is reported that No. 1 Foundry is not held with equal firmness by all parties. No. 3 Strong Foundry is quoted at full prices by Northern furnace companies, the demand for this grade having been unusually heavy in consequence of the change in progress in foundry practice. The demand for Lake Superior Charcoal is ordinarily very light at this time, but quite a number of buyers are figuring, and it is thought that the requirements of the Agricultural Implement manufacturers will bring them into the market earlier than usual, as they are running their works now to their full capacity. Prices are not so firm as they have been, owing to an accumulation of Nos. 1 and 2 at numerous furnaces, and concessions are being made on desirable orders. Cash quotations are as follows, f.o.b. Chicago: Lake Superior Coke, No. 1, \$16 @ \$16.50; No. 2, \$15 @ \$15.50; No. 3, \$14.50; Chicago Scotch, No. 1, \$17.50; Lake Superior Charcoal, Nos. 1 and 2, \$19.50; Nos. 3 to 6, \$20; American Scotch (Blackband), No. 1, \$18 @ \$19; Jackson County Silvery, No. 1, \$18; other Ohio Soft Irons, No. 1, \$17.25 @ \$17.50; Southern Coke, No. 1 Foundry, \$16 @ \$16.50; No. 2 Foundry and No. 1 Soft, \$15.50 @ \$16; No. 3 Foundry, \$15 @ \$15.50; Gray Forge and No. 2 Soft, \$14.25 @ \$14.75.

Bar Iron.—No improvement is to be noted either in demand or price. Mill lots of Good Common Iron are still quoted at

1.62½¢ @ 1.65¢, half extras, f.o.b., Chicago, but consumers insist that they are being offered better figures by salesmen for mills of good reputation. Store prices range from 1.80¢ to 2¢, according to quantity and quality.

Structural Iron.—So far this year manufacturers and dealers are doing most of their trading in prospects. There is a pleasing outlook, but very little immediate business. In view of the expected trade stocks are being replenished and "deals" fixed up. We quote as follows for mill lots, f.o.b. Chicago: Beams and Channels, 2.90¢; Angles, 2.10¢ @ 2.15¢; Tees, 2.55¢; Universal and Sheared Plates, 2.15¢ @ 2.20¢. Small lots from stock sell as follows: Beams and Channels, 3.40¢; Angles, 2.35¢; Tees, 2.75¢.

Plates, Tubes, &c.—The business transacted during the past week was fairly satisfactory. While not many mill lots were sold, one order was taken which covered some 200 tons of Plates. The quantity of business in sight promises a very active trade for the spring months in this line. Boiler Tubes are still quoted at old figures, and dealers are advising their customers to purchase a supply while they can be had so cheaply. Store quotations on small lots are as follows: Sheet Iron, Nos. 10 to 14, 2.50¢ @ 2.60¢; Sheet Steel, 2.75¢; Shell Iron, 3¢; Shell Steel, 3.12½¢; Flange Iron, 4¢; Flange Steel, 3.50¢; Fire-Box Steel, 4.75¢ @ 5.75¢; Boiler Rivets, 4¢ @ 4.25¢; Ulster Iron, 3.75¢; Boiler Tubes, 62½¢ @ 65¢ off.

Sheet Iron.—The demand is very light, and No. 27 Common Black now sells at 3.10¢ @ 3.20¢ in a jobbing way. The manufacturers of Galvanized Iron have made an advance of 2½¢ on deliveries to May 1, but jobbers still quote small lots of Juniata at 65¢ off and Charcoal at 65¢ and 2½¢ off.

Merchant Steel.—The demand is limited at present. The consumers of Spring Steel seem to be well supplied, and other heavy purchasers do not expect to be in the market any earlier than usual this year. Quotations are as follows, according to quantity: Soft Steel, 2.10¢ @ 2.30¢; Tool Steel, 7.75¢ @ 8¢; Specials, 13¢ @ 25¢; Crucible Spring, 3.75¢; Open-Hearth Spring, 2.20¢ @ 2.50¢; Open-Hearth Machinery, 2.30¢ @ 2.50¢; Tire, 2.20¢ @ 2.50¢; Sheet, 7¢ @ 10¢.

Steel Rails.—Manufacturers report a continued dull market, with no immediate prospect of a resumption of activity. They have not changed their quotations of \$30 @ \$30.50, according to quantity.

Old Iron Rails.—Buyers from other sections have appeared in this market and have stiffened prices, although it is understood that the purchases made only covered a couple of thousand tons. For these they paid \$21, Chicago, but it is doubtful if more could be had at that figure just now, as holders are disposed to wait for higher prices.

Scrap Irons.—There is very little demand for any grade of Scrap, and small dealers are selling their stock at \$1 @ \$2 below regular quotations whenever they get an accumulation. Some inquiries are made for Mill Scrap at prices considerably below what holders are asking. Dealers quote for Mixed Country Scrap \$14. Quotations to consumers are as follows, per ton of 2000 lb: No. 1 Railroad Shop, \$20; Fish Plates, \$21; Mixed Track, \$18 @ \$19; No. 1 Mill, \$14 @ \$16; Pipes and Tubes, \$13 @ \$14; No. 2 Mill, \$9.50; Axles, \$25; Horseshoes, \$18 @ \$19; Machinery Cast, \$13.50 @ \$14; Stove Plate, \$11; Cast Borings, \$8.50; Wrought Turnings, \$11 @ \$12; Axle Turnings, \$13.50; Mixed Steel, \$11; Coil and Leaf Steel, \$15; Tires, \$15.

General Hardware.—The demand for Shelf Hardware has been better the past week, appearing to fluctuate with the weather, which has been more spring-like. February was comparatively dull, but it is not expected that March will follow suit, as in many sections a great deal of outdoor work will be prosecuted which will call for a heavy consumption of Hardware. House-Furnishing Goods are in fair demand, as well as Tools, Steel Goods and Staples generally. A new Screw list has been issued, which differs from the old one in naming lower prices and a less discount, but which, however, is understood to make an average advance over the former net prices of about 7½%. In Hardware generally the tendency seems to be upward, while in staple goods it is precisely the reverse. The jobbers of Heavy Hardware complain of decided dullness in their branch of trade, which should at this time be experiencing a fair degree of activity.

Nails.—Steel Nails are still selling at \$2 @ \$2.05 in small lots, and \$1.95 for carloads. The manufacturers are the only ones in the Nail trade maintaining a firm front. They are being undersold by the jobbers, who have long time contracts for stock at low figures, enabling them to control this market effectually. Nevertheless, it is expected that at the next meeting of the Nail Association a further advance of 5¢ in the factory price will be declared. Wire Nails are now being sold at \$2.40 for small lots and \$2.35 for carloads. The manufacturers are not quite so demoralized as they were, but they have as yet effected no understanding with one another, although something of the kind is regarded as very probable.

Barb Wire.—This branch of trade is in about the same condition as the Nail trade. Jobbers are selling small lots of Painted at \$2.65 @ \$2.80, and carloads at 5¢ @ 10¢ per 100 lb less. Galvanized maintains its advance of 60¢ per 100 lb on Painted. At present there seems to be no prospect of an advance.

Pig Lead.—Dealers report a very quiet week, consumers buying only to cover their immediate wants, and their views of the future being colored to some extent by the large stocks still held. At the beginning of the week \$3.60 was asked, but with sales of less than 200 tons prices weakened to \$3.55 and to \$3.50.

Cincinnati.

Office of *The Iron Age*, Fourth and Main Sts., CINCINNATI, March 4, 1889.

Pig Iron.—The local market has been somewhat irregular during the week, but has given further evidence of improvement. Yet the recovery is so gradual that it fails to impart general confidence. There has been more inquiry, and, in exceptional instances, a few transactions of moment have been made. An advance of 25¢ @ 50¢ per ton has been realized on the prices current during the period of the recent depression, but there are still instances of sales almost, if not quite, as low as those current a few weeks ago. Furnaces, especially in the South, are well sold ahead on Foundry grades, and are refusing to make further large contracts for future delivery, except at an advance, which buyers are not yet ready to pay. Shipments from furnaces during the week have been large, in some instances unprecedented, but production is active and buyers point to the fact that there was a large increase in stocks in January, with the probability of a further increase, although smaller in February, the present month has not progressed far enough to indicate its tendency, and there are views both for and against an increase in stocks. Southern advices lead

to a belief of a reduction rather than otherwise, while it is claimed Northern stocks will show an increase. Among the sales made during the week is reported one lot of mixed Forge grades of 11,000 tons; Gray Forge selling at \$13; Close Bright at \$13.25; Open Bright at \$14.50; Silvery at \$13 @ \$13.25 and Mottled at \$12.50. There were also reported sales of Gray Forge at \$12.75; 1500 tons do. at \$13.25 and 1000 tons do. at \$13.50; 500 tons No. 1 Southern Foundry at \$15, all cash. Car-Wheel Iron has been quiet. Mottled Iron has sold as low as \$12, spot. The following are the approximate prices current here at the close for cash, f.o.b.:

Foundry.

Southern Coke, No. 1 (new classification)	\$15.00 @ \$15.50
Southern Coke, No. 2 (new classification)	14.50 @ 14.75
Southern Coke, No. 3 (new classification)	14.00 @ 14.25
Ohio Soft Stone Coal, No. 1	15.00 @ 16.00
Ohio Soft Stone Coal, No. 2	14.50 @ 15.00
Mahoning and Shenango Valley	15.50 @ 17.00
Hanging Rock Charcoal, No. 1	21.00 @ 22.00
Hanging Rock Charcoal, No. 2	19.00 @ 22.00
Tennessee and Alabama Charcoal, No. 1	18.00 @ 18.50
Tennessee and Alabama Charcoal, No. 2	17.00 @ 18.00

Forge.

Strong Neutral Coke	13.00 @ 13.50
Mottled Neutral Coke	12.00 @ 12.50
Gray Forge	13.00 @ 13.25

Car-Wheel and Malleable Irons.

Southern Car-Wheel	20.00 @ 25.00
Hanging Rock, Cold Blast	22.00 @ 25.00
Lake Superior Car-Wheel and Malleable	21.00 @ 22.00

Manufactured Iron.—The market has remained quiet, but steady, for all kinds.

Nails.—The market has remained moderately active, and a firmer tone has prevailed, with Steel Nails especially firm and in better demand. 12d @ 40d sell at \$1.95 @ \$2 per keg, with 10¢ rebate in carload lots at the mills. Steel Nails sell at \$1.90 @ \$2, and Steel Wire Nails at \$2.55 @ \$2.60 per keg.

Old Material.—There has been a moderate demand and a steady market for Old Wheels, which sell at \$18 @ \$18.50. Old Rails have ruled easier, with moderate sales at \$21.50, cash.

Chattanooga.

Office of *The Iron Age*, Carter and 9th Sts., CHATTANOOGA, March 4, 1889.

Pig Iron.—There is a better feeling all along the line as to the condition of this market. Prices at which sales were made a few weeks ago are not entertained now, but an advance of 25¢ @ 75¢ per ton is being asked, with many sales at this advance, and there is still a disposition manifested to still advance the prices under the influences of the many inquiries that are being made. The movements of good brands of both Foundry and Forge are by no means sluggish, and there is scarcely a furnace in the Southern districts that has any accumulation of this kind of stock on their yards. The policy of many of the stacks has been heretofore to sell large blocks for future deliveries. Such sales, of course, keep the yards well cleaned up, but those of the furnaces that have not entered into such transactions made sales not in such large lots, but more frequent in number, and, as a general thing, they are realizing a rather better price. While there have been some sales at low figures, yet it must be borne in mind that there is a considerable difference in the quality of Iron that is being turned out by the Southern stacks, and No. 1 Foundry of one furnace is steadily bringing at least \$1 per ton more than the No. 1 of another. An Iron that has always had a good reputation among consumers cannot be had now at less than \$13.75 @ \$14, at the yard, and these figures can be taken as a basis of the present condition of the market.

Miscellaneous.—There appears to be no falling off in the disposition of moneyed

men to make investments in Southern enterprises. Within the past year there has been 23 large sawmills put up on the line of the Georgia Southern Railroad, a new road recently built from Macon south. There are now in course of erection on the same line of road about 25 more, all of which will be completed during the present year. Much of this, of course, is not being done with local capital, but there seems just now to be a greater disposition than ever for a few Eastern and Northern men to combine, throwing into a pool several hundred thousand dollars, and settle on one of the many Southern points that are yet available and force such places into importance by the use of money and the many advantages that nature has placed at their disposal. The effect of these transactions is already being felt through the entire South, and there are those who predict that the time is near at hand when the whole South will take upon herself a much greater boom than any that has occurred in the past.

Louisville.

LOUISVILLE, KY., March 4, 1889.

Pig Iron.—The market has been quiet during the past week, with not much Iron offering. Buyers elsewhere are paying about 50¢ a ton over the lowest prices at which Iron, so far, has been offered. It is thought that a slight reaction has taken place, and furnaces can look forward to a somewhat stronger market. We quote as follows:

Southern Coke, No. 1 Foundry, new classification	\$14.75 @ \$15.25
Southern Coke, No. 2 Foundry, new classification	14.25 @ 14.75
Southern Coke, No. 3 Foundry, new classification	13.75 @ 14.25
Gray Forge	13.25 @ 13.75
White and Mottled, different grades	12.75 @ 13.25
Silver Gray, different grades	13.00 @ 13.50
Hanging Rock Charcoal, No. 1 Foundry	18.25 @ 18.75
" " No. 1 Mill	14.75 @ 15.25
Southern Car-Wheel, standard brands	21.75 @ 22.75
Southern Car-Wheel, other brands	18.00 @ 19.50
Hanging Rock Coke, No. 1 Foundry	15.50 @ 16.00
Hanging Rock Charcoal, No. 1 Foundry	19.50 @ 21.00
Hanging Rock, Cold Blast	20.75 @ 23.75

New York.

Office of *The Iron Age*, 65 and 68 Duane street, NEW YORK, March 6, 1889.

American Pig.—The consensus of opinion is that, while there is no notable increase in buying, the market shows a slightly better tone. The improvement is largely negative—that is to say, there is not as much pressure to sell by weak holders, and bargains are not so liberally hawked about. Reports from consumers are still conflicting. Until many of them see enough ahead in the way of work, they are not likely to become liberal buyers. We continue to quote for standard brands Northern Iron No. 1, \$17.75 @ \$18; No. 2, \$16.50 @ \$17, and Gray Forge, \$15 @ \$16, all at tidewater.

Scotch Pig.—In spite of higher prices abroad, the market has not moved here to any appreciable extent. We quote: Coltness, \$20.50 @ \$21; Shotts, \$20 @ \$20.50; Langloan, \$20 @ \$20.25; Summerlee, \$20.25 @ \$20.50 and Dalmellington, \$19.25 @ \$19.50.

Structural Iron.—We quote Sheared Plates, 1.9¢ @ 2¢; Universal Mill Plates, 2¢ @ 2.1¢; Angles, 1.9¢ @ 2.10¢; Tees, 2.4¢ @ 2.6¢, and Channels and Beams, 2.8¢ on dock for all sizes. Sales of Beams are reported at 2.7¢ at Boston. The Brooklyn elevated extension work was taken by an Eastern Pennsylvania mill.

Plates.—We quote Iron Tank, 2¢ @ 2.2¢; Shell, 2.25¢ @ 2.4¢; Steel Tank and Ship Plate, 2.1¢ @ 2.25¢; Shell, 2.85¢ @ 2.5¢; Flange, 2.6¢ @ 2.75¢, and Fire-box, 3½¢ @ 4¢.

Bar Iron.—We quote: Carload lots on dock, half extras, Common, 1.65¢ @ 1.7¢; Medium, 1.7¢ @ 1.75¢, and Refined, 1.75¢ @ 2¢.

Steel Rails.—No sales of any consequence are reported this week. There are a number of inquiries in the market, one of the Eastern Steel companies estimating that the business in sight aggregates 75,000 tons at least. In the West the situation remains unsatisfactory. Outside of a lot of 8000 to 10,000 tons for delivery at Duluth or St. Paul, for a new road in the Rocky Mountains, there is no business of any consequence pending. As indicating how little the roads in the territory tributary to the Western mills are buying, we may note that a transcontinental road asking for bids on about 2000 tons, delivery Omaha. Under ordinary conditions, such a road would require many times the amount. The Board of Control holds a meeting to-day at Philadelphia to arrange for an increase in the allotment. We quote \$27 @ \$27.50 nominally. There is a large order in the market for 80-pound Rails.

Nail Slabs.—Some purchases have been made at \$28 at mill, and the tone is steadier.

Wire Rods.—No business is reported. We quote nominally \$41.50 @ \$42 for Foreign.

Old Rails.—The market is very dull. Stocks are low. We quote nominally \$23 @ \$23.50 for Tees.

Galvanized Sheets.—At a meeting in Philadelphia the discount has been advanced to 65 % and 5 % for large lines.

A. T. Shoemaker, Duncan Building, 11 Pine street, has been appointed representative of the North Chicago Rolling Mill Company, the Juliet Steel Company, and the Union Steel Company, for the sale of Steel Rails, &c.

Metal Market.

Copper.—When we reported last week spot Chili Bars, Good Merchantable, were still quoted in London, £78. Since then quite a drop has occurred to £69 yesterday, while futures at the same time gave way from £66 to £60, sales aggregating 500 tons. The panic into which London has been thrown arises from the impression that the syndicate has got into severe financial straits. The monthly statement of visible supply of Copper in England and France showed an increase of 9000 tons, while the deliveries were confined to 1400 tons. These statistics were well calculated to aggravate the situation and precipitate a decline, causing the bears in London to offer futures at £59 for the balance of the year. Here the market was so thoroughly demoralized that for a couple of days nothing was done, until yesterday, when 25,000 lb March were sold at 15½¢. Casting brands have sold at 15¢ here, 15.80¢ at Chicago and below 15¢ at Philadelphia, where a local fight is going on between three refiners. The sudden death of M. Denfert-Rochereau, of the Comptoir d'Escompte, at Paris yesterday, caused a panic in Copper shares on the Exchange there. The following is the dispatch as received by the Associated Press, dated yesterday: "Wild fluctuations marked Metal shares from noon until the close. Société des Métaux shares fell to 188, and when the panic abated they closed at 192. Rio Tinto touched 382 and closed at 397. Comptoir d'Escompte ranged between 800 and 860, the final quotation being 810. Stocks beyond the sphere of copper speculation remained unshaken. Rentes were irregular, but 3 % closed only 10¢ lower for the day. To-

tomorrow, it is understood, will be big with fate for the Copper syndicate, the negotiations for an arrangement with all the mines, including American, finally succeeding or failing. Société de Métaux shares were quoted on Saturday at 280 francs. It is reported that the Chamber of Deputies will discuss the question of the workings of the French syndicate which has secured control of the Copper market." The latest special spot quotation from London is £84. 10/, with no quotation for futures. Our market is paralyzed and altogether nominal, pending further developments in Europe and here. It stopped buying last Thursday, and there was a very sharp decline, not only in its own shares and in those of the mining companies, but also in the leading Paris bank, which is identified with the speculation. In Boston there was a similar fall in shares, so that on Monday the impression was widespread that the end was near. The latest advices, however, show that Boston has recovered somewhat, and that the feeling in Paris, too, is stronger, Société shares rallying to 240 francs. This is probably due to the very important meeting held in this city yesterday between a representative of the Rothschild's, the agents of the syndicate and the American mining companies, including the Anaconda, Calumet and Hecla, Tamarack, Boston, Montana, Atlantic, Central, Quincy and the Arizona companies. It is reported that the meeting was very harmonious, and that all present agreed to a restriction of output, subject to confirmation by the respective boards of directors. The exact percentage is not known as yet. It is variously reported at 15 and 25 %. For the present the price has been left untouched, but it seems certain that there must be some readjustment. The initiative in this latest move appears to have, therefore, been taken by the American companies. The foreign, notably the Spanish, mines must follow, and that very quickly. The mines have as great an interest in the fate of the syndicate as those connected with it, and there are very powerful financiers who cannot afford to let it fail, without having exhausted every means at their disposal. A reduction in the price here is, however, almost as imperative as a reduction of the output. The Spanish export figures for last year are now published, showing that there were shipped 825,045 tons of Pyrites, against 766,801 in 1887, and 671,897 in 1886; and of precipitate 29,105 tons, against 29,890 and 27,003.

Tin—Has been comparatively little affected by the tumble in Copper, declining from £95. 10/ a week ago to £95 for spot and futures from £96. 5/ to £95. 15/ in the London market, sales running up 900 tons. Considering that the monthly statistics exhibited an increase in the visible supply in Europe and America of 1700 tons, it must be confessed that the Metal has, under the circumstances, stood its ground remarkably well. The market here at first ranged between 21.45¢ and 21.75¢ on the spot, 21.40¢ and 21.65¢ March, and 21.40¢ @ 21.50¢ for April, leading at the close to sales of 30 tons spot from 21.60¢ to 21.50¢, closing at 21.55¢ yesterday, while 20 tons March were sold from 21.45¢ down to 21.35¢. During February, as per cable from Gillilan, Wood & Co. to Mr. Chas. Nordhaus, New York, there were shipped from the Straits Settlements to the United States 800 tons, against 250 last year, and to England, 2750, against 2500; total shipment, since January 1 to America, summing up 1850 tons, as compared with 650 same time last year, and 3950, against 6000 to England. Spot Tin declined in London this morning from £95 to £94. 17/6,

futures remaining unaltered. **Tin Plates** have been dull and featureless in this city during the week, while continuing to be well held in England. Futures are held higher in this market, but consumers do not feel disposed to take hold of them as long as a general cloud overhangs the Metal market. We quote at the close, large lines, per box: Siemens-Martin Steel, Charcoal Finish, \$4.75 @ \$5.50; Ternes \$4.12 @ \$4.25; Coke Tins, \$4.22½ @ \$4.30, and Wasters \$4.12½ @ \$4.15. The quotation in Liverpool is 13/ for Coke Tin. As per Board of Trade returns the January export from England amounted to 37,678 tons, against 26,197 in 1888 and 20,310 in 1887; out of these amounts the United States received 28,471, 21,372 and 14,485, respectively, the price of Coke Tins averaging in January 13/ against 14/7 in 1888, and 13/ in 1887.

Lead—Has been devoid of features and quite inactive in our market, some 400 tons being taken in lots at 8.65¢ @ 8.75¢, the closing figure being 8.70¢. At the West, the quotation remains 8.45¢. London has kept steady at £12. 17/6 for Soft Spanish, while English Pig has improved to £13. 2/6 Spain exported last year 129,160 tons of Pig Lead, against 130,797 in 1887, and 114,471 tons in 1886.

Spelter—The domestic article has been more freely offered and cannot be quoted now over 4½¢, while Silesian remains little sought after at 5½¢. Spanish exportation of Calamine amounted last year to 26,098 tons, as compared with 22,841 in 1887, and 26,624 in 1886. London remains steady at £17. 10/.

Antimony—The demand has continued on a moderate scale and at well-sustained figures, being 18½¢ for Cookson, and 12¢ for Hallett.

New York Metal Exchange.

The following sales are reported:

FRIDAY, March 1.	
10 tons Tin, April	21.40¢
MONDAY, March 4.	
10 tons Tin, spot	21.60¢
10 tons Tin, March	21.45¢
TUESDAY, March 5.	
10 tons Tin, spot	21.40¢
50 tons Lead, March	3.72½¢
10 tons Tin, spot	21.50¢
10 tons Tin, March	21.35¢
25,000 pounds Lake Copper, March	15.75¢
WEDNESDAY, March 6.	
20 tons Tin, March	21.30¢

Coal Market.

The Anthracite Coal trade is dull and despondent, the advent of March bringing with it a promise of milder weather, while as yet the winter's accumulations are a standing menace to firmness in prices. At Port Richmond alone there is in stock no less than 220,000 tons. The Coal managers are conferring in reference to opening prices for the new year, and an announcement from the sales agents touching this point will be looked for not later than the 15th inst. Production for the week ending March 2 has fallen to 477,553 tons, a decrease of 27,600 tons compared with the previous week, and 229,000 tons compared with the same week in 1888. Since January 1 the total is 4,793,510 tons, a decrease of 887,338 tons compared with last year. Selling prices by individuals average about 50¢ per ton below the regular schedule, and in other directions sales are reported at a concession. Quotations are: Hard White Ash, Lump, \$4.50; Broken, \$4.15; Egg, \$4.40; Stove, \$4.65; Chestnut, \$4.55; Free-Burning, f.o.b., Broken, \$3.95; Egg, \$4.30; Stove and Chestnut, \$4.65; Pea, \$2.75.

Bituminous Coal prices are irregular on a narrow margin of profit, and the market is dull. Rates to lake ports are unchanged.

Harbor and Eastern freights are on the lowest basis. George E. Barnett has associated himself with the old house of Percy Heilner & Son, No. 1 Broadway, for the handling in this market of the White Ash and Red Ash Coals of the Philadelphia and Reading Coal and Iron Company, direct from the mines. The argument in the case of Cox & Bros. & Co. vs. the Lehigh Valley Railroad Company, before the Interstate Commission, has been postponed until March 14.

The annual report of the Lehigh and Wilkesbarre Coal Company shows that the receipts for Coal last year were \$9,563,866, and the net earnings \$1,986,521. The total Coal tonnage was 2,694,932 tons.

The Poughkeepsie Bridge Company and the railroad lines that connect are considering the plan of introducing the Dodge storage system at some point east of the bridge, where stocks can be accumulated during the summer and fall for winter distribution throughout New England. Cumberland shipments for the week were 56,600 tons; Clearfield, 61,500; Rochester, 36,888; Beech Creek, 24,880.

Financial.

Events transpiring at Washington as yet have no perceptible effect either in the Wall street markets or in business circles generally. The absence in the President's Inaugural Message of any allusion to Treasury management or questions of finance or currency would indicate on his part no sense of disquietude or anxiety with reference to the future, and it remains to be seen that the selection of Secretary Windom to represent the Treasury was not the wisest that could have been made. The President approved the Interstate Commerce act, which was finally passed substantially as prepared by the Senate Committee on Interstate Commerce. One change made is the requiring of three days' notice of any proposed reduction in the published rates of a railroad. Special provision is made to prevent and punish "underbidding" or discrimination. The provisions of the act in regard to the publication of rates are made to apply to joint through rates. Other amendments are intended to complete the power conferred upon the Commissioners, with the special purpose of enforcing the penalties imposed for violation of the law. The proposed amendments relative to the jurisdiction of State's courts and transportation of oil in barrels or tanks were rejected. In reference to the "agreement among gentlemen," Judge Cooley has been furnished with evidence against certain of the weaker roads manipulating freight rates out of Chicago, and said when he left for New York last week he thought the prosecution of some roads was certain. The outcome of the matter will be watched with interest, since hitherto aggressive action has too often provoked retaliation.

The Stock Exchange markets, pending a change of Administration at Washington, were devoid of feature, transactions being confined almost wholly to professional traders. The feeling prevailed in regard to the future that much depended on the success of the endeavors to secure the services of Interstate Commissioner Walker as chairman of the Interstate Railway Association. The market was unaffected by President Harrison's inaugural. The tone of the market was generally strong. On Tuesday the tone was generally strong to near the close, when it became irregular and lower. Manhattan was unfavorably influenced by the declaration of a 1½ % scrip dividend, convertible into new 4 % bonds. The report of the failure of the Reading Iron Company caused something of a flutter. It was understood that a reorganization would fol-

low, the creditors funding their indebtedness, but no statement has been made.

Government bonds are quoted as follows:

U. S. 4½, 1891, registered.....	107½
U. S. 4½, 1891, coupon.....	107½
U. S. 4, 1907, registered.....	127½
U. S. 4, 1907, coupon.....	128½
U. S. currency 6s.....	120

The general business situation is not altogether satisfactory, although the spring demands for various classes of merchandise are assuming larger proportions, and a fair distributive movement is in progress. With dry-goods jobbers prices on all desirable goods are steady, and a better feeling is noted, but accounts respecting trade at interior points are not uniformly good. Wholesale grocers report prices firm, with coffee and sugar tending upward. On the Produce Exchange spot wheat is depressed and spot corn very slow. Cotton is steady on a moderate demand. Provisions are higher all around, with good buying by English houses. Exports from Atlantic ports of bacon and pork are larger than for the corresponding week last year. The total east-bound tonnage from Chicago last week was 65,345 tons, against 68,651 the week before, and 58,129 for the same week last year.

The total clearings of 40 cities last week show an increase of 16%, compared with the same week last year. For the month of February there was a gain of 11.4%, compared with the same month in 1888. New York gained 17.2%; Boston, 8.3%; Philadelphia, 16.8%; Chicago, 7.9%; New Orleans, 19.9%; Kansas City, 25.1%.

The weekly statement of the associated banks was unfavorable, showing a loss of \$3,469,600 in surplus reserve, which is now \$12,270,550, against \$12,744,700 one year ago and \$9,088,000 at the corresponding date in 1887. Loans were increased \$4,045,000; specie decreased \$3,756,400, showing the effect of Treasury absorptions and shipments to other points, the requirements for Boston being unusual; deposits increased \$204,400. Money was in better demand, attended with firmer sales. Lenders were disposed to await official announcements serving to disclose the future policy of the Government respecting bond purchases. The supply of commercial paper is better, but not equal to the demand. Endorsed bills receivable are quoted at 4%, 60 @ 90 days; longer dates 4½ @ 5%. Mercantile houses are expected to put out their usual lines of paper as the season advances. Banks are discounting little, except for customers. The market for sterling is very dull, there being practically no bills, grain, provision, cotton or security offering.

The official statement of foreign commerce for January, issued by the Bureau of Statistics, discloses the fact that during the first month of the new year merchandise exports and imports each exceeded in value those of the same month of 1888 by \$10,000,000. The volume of January imports is unprecedented, being \$18,000,000 above the average of the five years preceding. The volume of January exports was greater than for any year since 1885, and \$5,000,000 above the average for the five years preceding. The value of exports for the month was \$73,470,000, and of imports \$68,348,000. For the seven months of the fiscal year exports have aggregated \$454,204,000, compared with \$447,961,000 for the same period of last year. Imports have amounted to \$420,932,000, compared with \$409,851,000 for the same seven months of the preceding fiscal year.

The new Union Square Bank in this city opened for business on Monday with \$200,000 deposits. The United States Savings Bank of the City of New York, organized to do business in the Nineteenth Ward, has been incorporated. Ex-

Secretary Fairchild becomes the head of the newly-organized New York Security and Trust Company. Announcement is made that enough subscriptions have been offered to absorb four times the capital stock. The public debt statement for February shows an apparent increase in the debt of \$6,443,344. This is owing to unusually heavy expenditures for pensions and premiums. The receipts for the fiscal year thus far are about \$1,000,000 more than for the same period last year, while the expenditures are \$39,000,000 more. The surplus is \$48,096,158—a decrease of nearly \$17,000,000.

Exports for the week are \$6,754,600, and include 581,000 bushels of corn, 137,000 bushels of wheat, and 28,000 bales of cotton. Since January 1 the excess is \$7,500,000, compared with last year.

Imports.

Hardware, Machinery, &c.

Boker, Hermann & Co., Mds., cs., 52; Arms, cs., 43; Anvils, 10
Clark, G. A. & Bro., Mach'y, cs., 318
Curley J. & Bro., Mds., cs., 1
Folsom Arms Co., H. & D., Arms, cs., 8
Foley, Edw., Mach'y, pgs., 12
Field, Alfred & Co., Mds., cs., 49
Graef Cutlery Company, Cutlery, cs., 6; Hdw., cs., 13
Hammacher, Schlemmer & Co., Nails, cs., 19
Hartly & Graham, Mds., cs., 9
Johnson Foundry Company, Iron Pots, 4
Kastor, Ad. Mds., cs., 10
Lau, J. H. & Co., Arms, cs., 6
Merch. Despatch Company, Mach'y, cs., 8
Ogden, H. C., Hdw., cs., 2
Outerbridge, A. E. & Co., Hdw., pkg., 1
Pim, Forwood & Co., Dutch Stoves, 54
Schoverling, A., Arms, cs., 17
Schoverling, Daly & Gale, Arms, cs., 18
Sanderson & Son., Mach'y, pgs., 25
Taylor, Thomas, Mds., cs., 7
Thebaud Bros., Mach'y, pgs., 1570
Order, Brass Goods, cs., 8; Mach'y, pgs., 58;
Crank-Pins, 15

British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, March 6, 1889.

The Copper market has continued unsettled and depressed. The syndicate agents have refused to purchase Merchant Bars for prompt delivery and it is stated that they have abstained from buying forwards since January. The further statement is made that they have refused this week to take cash warrants. On Monday prices fell £8, owing to the decline in the shares of the Société des Métaux, and by this decline, it is believed, the credit companies connected with Société suffered most. At this center the outlook is considered more serious than ever before, the immense stock held by the syndicate, which was at high prices, it is said, causing fresh outlay of money and necessitating further borrowing. According to statistics published this week, the consumption in 1888 was 7½% less than in the preceding year.

Copper Furnace material has depreciated, in partial sympathy with the decline in the prices of Bars. Among late sales is noted 400 tons American Matte at 14/3 3/4 unit, and subsequently 60 tons ditto at 14/, f.o.b. Liverpool.

LATER.—No definite information can be obtained as to the result of the negotiations of the syndicate on new contracts. Opinions are variable, but there is an impression at the close of business that the syndicate will save itself. Their agents are again purchasing. The final transactions were at £64. 10/ for prompts.

The demand for Block Tin for consumption is improving. This fact and

higher quotations from New York, together with reports of a larger business there, causes speculators to operate more freely. The market has also been benefited by advices of probable smaller shipments from the Straits. Prices have suffered a temporary reduction, but the market is again stronger. The Billiton sales realized equal to £97. 10/ in Holland.

Prospects for the formation of the Steel Rail syndicate continue favorable. It is stated that the proposal submitted very recently is well received by all the makers. A committee has been appointed to draw up the plan of the scheme in full on the basis presented. It is believed that the makers in the Cumberland district arranged to have orders for Rails booked by Bolckow, Vaughan at late rates. Prices for rails are hardening and quoted one-third higher. Some advance is also quoted on Blooms and Slabs.

The Tin-Plate trade is somewhat disturbed by labor disputes. The Worcester works (eight mills) have closed, and the Upper Forest works (twelve mills) are likely to follow. There is plenty of inquiry at the present time, but little business, as makers are refusing orders at the prices offered.

The Pig Iron market continues to harden under the influence of increasing home consumption. Speculation is comparatively small. There is some talk of blowing in more furnaces in Scotland. Most brands of makers' Iron are again 6d to 1/ higher this week. Middlesboro' Pig has been sold at 9d rise, and Hematites are a good 6d up, with liberal purchases at the advance. Old Rails and Scrap Iron are without improvement.

Scotch Pig.—There continues to be a large business and prices are strong:

No. 1 Coltness, f.o.b. Glasgow.....	54/6
No. 1 Summerlee, " ".....	54/
No. 1 Gartsherrie, " ".....	51/
No. 1 Langloan, " ".....	58/
No. 1 Cambro, " ".....	45/6
No. 1 Shotts, " ".....	51/
No. 1 Glengarnock, " at Leith.....	50/
No. 1 Dalmellington, " Ardrossan.....	45/6
No. 1 Eglinton, " ".....	44/
Steamer freights, Glasgow to New York, 5/;	
Liverpool to New York, 10/.	

Cleveland Pig.—Trade has been large again, and the market is strong at the advance. No. 1 Middlesboro', G.M.B., 89/; No. 8 ditto, 86/9.

Bessemer Pig.—Demand continues large and prices still show advancing tendency. West Coast brands, mixed numbers, 47/ @ 47/6, f.o.b. shipping point.

Spiegeleisen.—The market remains firm and fairly active. English 20% quoted 80/, f.o.b. N. W. England shipping point.

Steel Rails.—Higher prices generally asked and the demand good. Heavy sections quoted at £4. 6/3, and light sections £4. 12/6 @ £4. 17/6, f.o.b. at N. W. England shipping point.

Steel Blooms.—Only a moderate trade, but prices firmer. We quote £3. 18/9 for 7 x 7, f.o.b. at N. W. England shipping point.

Steel Billets.—The market firm with demand fair. Bessemer, 2½ x 2½ inch, £4. 5/, f.o.b. at N. W. England shipping point.

Steel Slabs.—There is more demand for these and the market is firmer. Bessemer, £3. 18/9, f.o.b. at N. W. England shipping point.

Old Rails.—No improvement in the demand. Prices nominal. Tees quoted

at £3. 5/ @ £3. 6/, and Double Heads, £3. 8/ @ £3. 10/, c.i.f., New York.

Scrap Iron.—Demand continues slow. Heavy Wrought quoted at £2. 2/6 @ £2. 7/6, f.o.b.

Crop Ends.—A moderate business at barely steady prices. Bessemer quoted £2. 7/6 @ £2. 10/, f.o.b.

Tin Plate.—There is a very good demand and sellers are firm. We quote, f.o.b. Liverpool:

IC Charcoal, Allaway grade.....15/9 @ 16/3
IC Bessemer Steel, Coke finish.....13/8 @
IC Siemens.....13/9 @
IC Coke, B. V. grade.....13/ @ 13/3
Charcoal Terne, Dean grade.....12/6 @ 13/

Manufactured Iron.—Trade is of good volume and prices are very steady. We quote, f.o.b. Liverpool:

Staff. Ord. Marked Bars.....	£ s. d.	£ s. d.
Common.....	5 12 6	5 15 0
Staff. Bl'k Sheet, singles.....	7 12 6	7 12 6
Welsh Bars (f.o.b. Wales).....	5 0 0	5 2 6

Copper.—Market irregular and unsettled. The quoted prices at the close are: Chili Bars, £64. 10/ for spot; for three months futures, no market. Best Selected, £71 nominal.

Tin.—The market fairly active but somewhat irregular. Straits quoted at £95, spot, and £95. 10/ for three months' futures.

Lead.—The trade rather slow, but prices firmer. Quoted at £12. 17/6 for Soft Spanish.

Spelter.—A moderate business passing at steady prices. Quoted at £17. 12/6 for ordinary Silesian.

Foreign Markets.

EQUIVALENTS.

Franc, Peseta or Lira.....	Cents.
Florin (Netherlands).....	10.8
Florin (Austria).....	40.2
Witreis (Portugal).....	55.9
Witreis (Brazil).....	51.18
Mark (Germany).....	24.6
Kilogram.....	Pounds.
Picul.....	2.206
	134.

CHILI.

VALPARAISO, January 4, 1889.—**Copper.**—Dealings have been restricted by the fact that the mines are under contract all the way to the middle of February, and that consequently they may hold back; hence only 5050 quintals were sold at \$26.40 @ \$27 per quintal, as to brand. The price of \$26.25 equals £73. 19/2 per ton, with 30/ freight to Liverpool. **Coal.**—There being considerable difficulty just now in landing Coal at the Nitrate ports, it is not easy to place the latest cargoes arrived; thus New Castle does not bring over 37/6 per ton, on the spot, while afloat it cannot be had for less than 42/6 @ 45/. **Freights.**—Rates are weak, there now being 60,000 tons of ships' room seeking freight. For Nitrate to England 28/9 @ 30/ have been paid; for the Continent 33/9 @ 35/, and for Guano respectively 34/ and 36/3. **Exchange.**—Drafts on London, 90 days' sight, are bringing 28 1/2 d.—Weber & Co.

EAST INDIES.

SINGAPORE, January 21, 1889.—**Tin.**—Has been in brisk request and well sustained, some 365 tons selling at \$36.87 1/2 @ \$37.25 per picul, and there are buyers still at \$37. **Gum Damar.**—A sale has been effected of 20 piculs Palembang at \$19.50 per picul. **Gum Copal.**—Some 60 piculs have changed hands at \$7.55 @ \$11.05, and for a couple of boxes Gum Benjamin from Penang \$38 per picul has been paid. **India-Rubber.**—Borneo is scarce and wanted, ordinary qualities fetching as much as \$38 @ \$39 per picul. **Gutta-Percha.**—Is offered sparingly, so that good quality sells with the greatest ease at \$125 @ \$135 and medium at \$80 @ \$125. **Exchange.**—Bank drafts, four months' sight, 3/1 1/2.—Gillilan, Wood & Co.

MANILA, February 25, 1889.—**Hemp.**—There are buyers at \$16.75 per picul, against \$8.58 a year ago, equaling per ton, cost and freight, \$56. 12/6, as compared with £20. 12/6 in 1883. The clearances for the United States since last cable amount to 7000 bales, against none last year, and since January 1 to 60,000, against

19,000. There remain loading for the United States 41,000 bales, against 22,000; cleared for England since January 1, 44,000, against 38,000; loading for England, 11,000, against 18,000; cleared for all other ports, 6000, against 7000. Receipts at all ports since last cable, 17,000, against 7000; since January 1, 105,000, against 82,000 bales in 1888 and 68,000 in 1887. **Freight.**—\$7.50, against \$5. **Exchange.** 6 months' sight, 3/8, against 3/8 1/2.—Kerr & Co., per cable direct, to Mr. Charles Nordhaus, New York.

BELGIUM.

BRUSSELS, February 23, 1889.—**Iron.**—The Belgian market remains firm, there being a good demand for Finished and several large dealings have taken place among others. The Thy-le-Château Company, among others, made a sale of 17,000 tons Merchant Iron on the spot, and simultaneously received orders for 15,000 tons Beams. In the Castings line export orders are secure, but domestic ones are flocking in all the more actively. Steel is very firm. Cockerill is just executing an order for Havana for Steel Rails, at 111 francs, f.o.b. Our Government stands in need of 15,000 tons Goliath Steel Rails. Following has been the foreign Iron and Steel movement in Belgium in 1888 and 1887:

	—Import—	
	1888.	1887.
	Tons.	Tons.
Iron Ore.....	1,742,867	1,451,806
Ingot Steel.....	1,275	443
Steel Rails.....	249	166
Steel in sheets.....	2,516	2,339
Wrought Steel.....	887	370
Pig Iron.....	212,814	141,462
Scrap Iron.....	25,211	17,831
Iron Wire.....	3,495	3,923
Iron Rails.....	559	81
Sheet Iron.....	1,341	866
Other Iron.....	8,112	5,383
Nails.....	551	559
Wrought Iron.....	3,860	3,348
Castings.....	933	1,116

	—Export—	
	1888.	1887.
	Tons.	Tons.
Iron Ore.....	148,491	176,530
Ingot Steel.....	5,369	8,602
Steel Rails.....	62,661	48,910
Steel in sheets.....	24,818	26,397
Wrought Steel.....	4,009	2,761
Pig Iron.....	9,801	11,701
Scrap Iron.....	3,608	11,048
Iron Wire.....	3,761	3,839
Iron Rails.....	10,435	29,351
Sheet Iron.....	44,833	19,795
Other Iron.....	247,968	252,726
Nails.....	13,242	10,482
Wrought Iron.....	24,512	23,003
Castings.....	21,107	24,738

—Moniteur des Intérêts Matériels.

WEST INDIES.

PORT OF SPAIN, TRINIDAD, February 1, 1889.—**Asphaltum.**—A moderate business has been done during the fortnight at \$14.04 for Bolled per ton, f.o.b., including export duty, and \$6.84 for crude. January shipments have amounted to 1462 tons, as against 3631 in 1888, and 1175 in 1887. **Exchange.**—Drafts on London, 90 days' sight, may be quoted \$4.74 @ \$4.80.—E. F. Masson

SPAIN.

BILBAO, February 9, 1889.—**Iron Ore.**—Our market has been tolerably active, sales being restricted to a few single cargoes for immediate shipment. Meanwhile quotations have remained firm at 8/ @ 8/3 for Campanil and 7/ @ 7/3 for Rubios. The stock of Campanil is so much reduced that some mining companies have refused considering higher figures than those quoted. Meanwhile there is a glut of steamers, 140,000 tons ships' room waiting to take their turn in loading Ore. The weather has been so rainy that it has been impossible to take cargo regularly. Total shipments since January 1 amount to 416,836 tons, as compared with 446,642 same time last year. **Pig Iron.**—The export has been trifling, but there are now ready to take cargo four steamers and one sailing vessel for abroad and three steamers for the Peninsula.

P. S.—February 16.—There has been more doing, Rubios selling down to 7/, yet the actual amount shipped during the week has been restricted to 65,000 tons, in spite of the many steamers ready to load. In consequence of the frequent rain, nothing was done in the way of loading for several days. From January 1 to date there have now been shipped altogether 481,818 tons, against 504,410 last year. **Pig Iron.**—There were exported during the week 5492 tons, and shipped coastwise 1490. **Jet.**—Jet mining has been going on steadily for several years past in the provinces of Santander and Oviedo, the bulk of the product being sent to England; but for the moment competition between the various Spanish mines has caused the Oviedo production to temporarily shut down, the Santander Jet being offered at a

notable reduction, and the superior quality of the Oviedo not being fully appreciated. Washed Oviedo Jet in blocks has been selling hitherto within the range of 3s and 240 rials, according to quality and size of blocks, per quintal of 50 kg., the Spanish rial equalling 50 American. The Oviedo Jet can be worked to better advantage than the Santander, being harder, and therefore not splitting into chips as easily.

Export from Spain During the Past Three Years.

	1886.	1887.	1888.
	Tons.	Tons.	Tons.
Calamine.....	26,624	22,841	26,096
Pyrites.....	671,897	766,801	825,045
Iron Ore.....	4,187,527	5,215,713	4,563,779
Pig Iron.....	48,420	115,359	73,677
Precipitate.....	27,003	29,890	29,105
Quicksilver.....	541	1,355	1,105
Pig Lead.....	114,473	130,797	129,160

Total.....5,077,483 6,282,756 5,647,969

—Bilbao Marítimo y Comercial.

Status of the Blast Furnaces.

Reports from the blast furnaces received to date are not complete enough to enable us to present the final figures. We may state, however, that there has been no change whatever in New York, New Jersey or in the Upper Susquehanna Valley. In the Schuylkill Valley there has been a falling off in the capacity through the blowing out of Edge Hill and of Merion, nearly compensated, however, by the blowing in, on the 12th ult., of the Norristown. Phoenix blew in a second furnace on the 9th ult., but, on the other hand, one of the Pioneer furnaces stopped during February. In the Lehigh Valley the Allentown Rolling Mill Company blew in one furnace in February, and one of the Coplay stacks is at work. Against this there is to be noted that one Crane is out and that Keystone, one of the stacks of the Thomas Iron Company, has gone out for repairs, and will not be blown in before spring. Durham stopped toward the end of February, but is expected to be at work again in a few days. Reviewing the situation generally, among the anthracite furnaces there has been a slight falling off.

Reports thus far received from the coke furnaces indicate a slight decline in the output. In the Shenango, Juniata and Conemaugh and Youghiogheny valleys there has been no change whatever. In Maryland, Catocin was to start on the 4th. In Virginia and West Virginia no changes are reported thus far, and the same is true of Illinois and Indiana. In Ohio Emma has stopped, and Glasgow, in the Hocking Valley, is idle. In the Mahoning Valley Thomas blew in on the 27th ult., after a stoppage of 39 days, the furnace starting nicely on a heavy burden. In the South the only change reported thus far is the blowing out of Bibb Furnace. In Kentucky the second Ashland resumed late in the month. On the whole the indications point to a slight decline in the make.

The Atchison Car Spring Company, of Chicago, are having a serious time with the residents in their vicinity. Fish oil is used in the works to temper the springs, and it is claimed by the neighbors that the fumes arising from the burning oil are unbearably nauseating. Complaint is also made of the shaking of houses by the trip hammers used in forging the steel. The company have been beaten in the suits entered against them in the lower courts, having been fined some months since for maintaining a nuisance in the fish-oil tempering vats, and on the 2d inst. they were again mulcted. A more agreeable tempering liquid than fish oil can probably be found, but it is difficult to see how the work of forging springs can be prosecuted without noise or concussions.

Hardware.

Trade continues in fair volume and without special feature. Prices are remarkably steady, and with the exception of the advance in the price of Screws, as noted below, nothing of special importance has occurred. The trade throughout the country are buying carefully, but stocks on hand are generally low, and it is anticipated that before long there will be more marked activity. The manufacturers generally are pursuing a conservative course, avoiding undue accumulation of stock, and in some lines there is more or less difficulty in obtaining prompt shipments.

Barb Wire.

The market is characterized by more activity and prices remain without material change. In the territory covered by the agreement of the Eastern makers prices are regularly maintained, while for lots outside some slight concessions are made in special cases.

With reference to the statement in regard to the Barb Wire litigation in our issue, 24th ult., to the effect that suits against infringers of the Glidden patent were being pushed with energy, we have the following from the St. Louis Wire Mill Company, St. Louis, Mo.:

This statement is without the slightest shadow of foundation as far as facts are concerned. It is probably a well-known fact that our two companies, the Braddock Wire Company, Rankin, Pa., and St. Louis Wire Mill Company, St. Louis, Mo., are manufacturing more unlicensed Barb Wire than all others put together. Notwithstanding this fact the Washburn & Moen Mfg. Company withdrew their motion for preliminary injunction against Braddock Wire Company, pending in the United States Court at Pittsburgh, on July 1, 1888, at their own cost, not daring to go to trial on the merits of the case, although we, through our attorneys, answered ready at that time. Since then they have not made a move in court against either of our companies, notwithstanding the fact that we submitted a proposition, which you published in your valuable columns under date of July 23, 1888, offering to stipulate and go to trial on very short notice. Not later than last week we, through our attorney, John R. Bennett, 237 Broadway, New York, made the following offer to attorneys of Washburn & Moen Mfg. Company and I. L. Ellwood & Co., of Chicago, Ill.: To stipulate and prepare for a test case to be tried on short notice before His Honor, Judge Brewer, of the Eighth District, and any other United States Circuit Judge before whom any Barbed Wire patent may now be pending. This would include Judge McKennon of the Pennsylvania District, Judge Jackson of the Ohio District, or Judge Gresham, of the Illinois District. Each one of these districts, however, represents several States. This proposition, through their attorneys, the Washburn & Moen Mfg. Company refused to accept, although Judge Brewer is the only Judge who ever sustained the original Glidden patent, which is the only patent the Washburn & Moen Mfg. Company claim to be of any value, and which in its latest adjudication was declared invalid by His Honor, Judge Shiras, of the United States Court of the Eastern District of Iowa, in Dubuque, on January 5, 1888, since which time no decision has been obtained by the Washburn & Moen Mfg. Company sustaining any of their Barbed Wire patents anywhere in the known world.

Screws.

Under date March 1 the associated manufacturers of Wood Screws issue a revised list, which is given on another page, and announce the following discounts:

Flat Head Iron.....	50 %
Round Head Iron.....	40 %
Flat Head Brass.....	45 %
Round Head Brass.....	35 %
Flat Head Bronze Metal.....	45 %
Round Head Bronze Metal.....	35 %
Flat Head Iron Screws, Blued, are 5 per cent. advance on the net prices of the regular goods.	

A comparison of the prices thus announced with those which have heretofore prevailed shows that an advance of about

10 per cent. is made in the price of Iron Screws, and an advance of from 20 to 25 per cent. in the price of Brass Screws. The list, it will be observed, is thoroughly revised, and is regarded by the manufacturers as satisfactorily graded for the different sizes of Screw. The combination existing between the Screw companies enables them to make this advance and maintain firmly the new prices. This action would probably have been taken some time ago had it not been for the presence in the market of large stocks of Screws purchased at the old figures, some of which still remain to give more or less irregularity to current prices. But the stocks thus held are pretty well broken, and it is expected that prices will be well maintained.

The American Screw Company, Providence, R. I., have issued the following discount sheet, March 1, 1889, which besides giving the prices of the regular Wood Screws referred to above, gives, it will be observed, quotations on a large variety of special Screws of which they are manufacturers:

Iron, Bright, Flat Head.....	50 %
Iron, Bright, Round Head.....	40 %
Iron, Blued, Flat Head.....	50 %
Add 5 per cent. to net amount of invoice.	
Iron, Blued, Round Head.....	40 %
Iron, Felce, Flat Head.....	45 %
Iron, Pinched Head.....	45 %
Iron, Japanned, Flat Head.....	40 %
Iron, Japanned, Round Head.....	30 %
Iron, Tinned, Flat Head.....	40 %
Iron, Tinned, Round Head.....	30 %
Iron, Lacquered, Flat Head.....	35 %
Iron, Lacquered, Round Head.....	30 %
Iron, Bronzed, Flat Head.....	35 %
Iron, Bronzed, Round Head.....	30 %
Iron, Brass Capped, Burnished.....	40 %
Iron, Silver Capped, Burnished.....	40 %
Iron, Nickel-Plated, Flat Head, Burnished.....	75 %
Iron, Nickel-Plated, Round Head, Burnished.....	72 1/2 %
Iron, Silver-Plated, Flat Head, Burnished.....	60 %
Iron, Silver-Plated Round Head, Burnished.....	50 %
Iron, Brass-Plated, Flat Head.....	55 %
Iron, Brass-Plated, Round Head.....	55 %
Iron, Copper-Plated, Flat Head.....	55 %
Iron, Copper-Plated, Round Head.....	55 %
Brass, Flat Head.....	45 %
Brass, Round Head.....	35 %
Brass, Lacquered, Flat Head.....	35 %
Brass, Lacquered, Round Head.....	30 %
Brass, Bronzed, Flat Head.....	35 %
Brass, Bronzed, Round Head.....	30 %
Brass, Silver-Plated, Flat Head, Burnished.....	50 %
Brass, Silver-Plated, Round Head, Burnished.....	50 %
Brass, Nickel-Plated, Flat Head, Burnished.....	66 2/3 %
Brass, Nickel-Plated, Round Head, Burnished.....	66 2/3 %
Copper, Flat Head.....	35 %
Copper, Round Head.....	30 %
Bronze, Flat Head.....	45 %
Bronze, Round Head.....	35 %
Phosphor Bronze, Flat Head.....	30 %
Phosphor Bronze, Round Head.....	20 %

Miscellaneous Prices.

The address of Gaston, Weston & Ladd, whose Silver Compound, Prestoline, Prestoline Polish and other polishing compounds were referred to in our issue of the 21st ult., is 46 Beekman street, New York. The discounts on these goods from the price list then published are as follows:

Prestoline.....	20 & 10 %
Prestoline Paste.....	33 1/2 %
Gaston's Silver Compound.....	33 1/2 %

The following are the list prices of C. A. Maynard's Handled Planters' and Field Hoes, of which a description is given on page 379, and which are put on the market by Robert Murray, sole agent, 24 Duane street, New York. The list is subject to a discount of 65 per cent.

Planters' Hoes.

	6 in.	7 in.	8 in.	8 1/2 in.
Polished Blades, per doz.....	\$10	\$10.50	\$11	\$11.50
Unpolished Blades, per doz.....	9.50	9.50	10	10.50

Field Hoes.

Polished Blades, per doz.....	\$8
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William H. Jacobus, 90 Chambers street, New York, has been appointed agent for the sale of the Prindle Improved Door Hanger. It is listed at \$6 and is subject to a discount of 40 per cent.

Items.

The Wyeth Hardware and Mfg. Company, of St. Joseph, Mo., have been put to serious inconvenience by the fire which destroyed the printing establishment of the Geo. W. Crane Publishing Company, at Topeka, Kan., on the morning of the 22d of February. The entire edition (3000 copies) of their new catalogue, almost ready for delivery, was utterly consumed, together with the woodcuts and electrotypes, many of which had been specially engraved for them, which were being used in the last part of the book. An immense amount of work had been put on this catalogue by the officers of the company, who had intended to make it a publication which would be appreciated by the Hardware trade generally and become a valuable book of reference, so that its loss is seriously felt. As to future plans, nothing can be formulated until matters are somewhat settled at Topeka.

The trade will observe on page 88 the advertisement in which Peabody & Parks, Troy, N. Y., illustrate the Farmer's Favorite Potato Bug Exterminator, manufactured by them under Eddy's patent. Its utility for applying Paris green, phosphates, &c., to plants is referred to.

D. W. Bosley & Co., Chicago, Ill., issue a six-page leaflet, in which they illustrate their Window Cleaners, Floor Scrubbers, and Bar and Counter Cleaners.

The Hardware business of H. M. Gay & Bro., Milwaukee, Wis., has been discontinued, and Henry M. Gay has made an engagement with Horton, Gilmore, McWilliams & Co., Chicago, Ill., and will travel for them over a portion of the route which for the past 14 years he has been covering for the Biddle Hardware Company, Philadelphia. He will thus visit the larger towns in Wisconsin and Minnesota. Geo. S. Gay engages in the Hardware business at Jacksonville, Ill., in partnership with George Hayden, the style of the firm being George Hayden Hardware Company.

It will be seen that in their advertisement on page 87 the New Departure Bell Company, for whom John H. Graham & Co. are agents, 118 Chambers street, New York, illustrate the New Departure Door Bell and point out its advantages.

Canastota Knife Company, Canastota, N. Y., are sending out a new illustrated catalogue and price list of their line of Pocket Knives. It is obvious that in the preparation of it much care has been taken to make it as attractive and serviceable as possible. An interesting variety of patterns is exhibited, the engraving of the handles representing satisfactorily the different materials of which they are made. It is certainly one of the most complete and satisfactory Pocket Knife catalogues offered to the trade, and illustrates the enterprise and progress of the company.

Hoen & Von Kapff, Baltimore, Md., have prepared a small pamphlet which simply calls attention to some of their leading lines and the parties for whom they are agents, without giving illustrations or descriptive matter. There are such headings as Guns, Ammunition, Gun Material, Reloading Tools, &c., under which leading articles in these departments are designated, and the names of manufacturers whom they represent are given with the principal goods manufact-

ured by them. The pamphlet seems well designed for the purpose for which it is intended.

The G. S. Foos Company, Springfield, Ohio, send out in convenient form samples of printed matter which they prepare for the use of their customers, illustrating and describing the various manufactures of the company. A number of leaflets are thus offered to the trade, showing the different kinds of goods, and calling attention to them in a popular way, so as to aid the merchant in selling them. The trade will appreciate the advantage of such literature.

The Collins-Gibbons Mfg. Company, St. Louis, Mo., issue a small pamphlet devoted to a description of their Spiral Wire Straightener and the Little Giant Wire Cutter. Illustrations of these articles are given and their utility is pointed out.

Springfield Glue and Emery Wheel Company, Springfield, Mass., manufacturers of Sapphire Garnet Paper, Emery and Corundum Wheels, and Emery Wheel Machinery, issue a circular calling attention to the advantages of Garnet Paper and alluding to the extensive mines of Garnet which they own. Their Sapphire Garnet Paper is especially referred to.

It will be seen from the announcement on page 63 that an established commission house on the Pacific Coast is desirous of representing one or two more lines of Hardware or Lumbermen's Supplies, for which they desire sole agencies for that market. We understand that they have represented satisfactorily some Eastern manufacturers for some time.

The Cincinnati Stamping Company, Cincinnati, Ohio, issue a circular describing their Water Coolers, of which different patterns are illustrated.

Early last Sunday morning the Hardware establishment of W. H. Hartley & Sons, Quaker City, Ohio, was destroyed by fire. The dwelling of Wm. H. Hartley, adjoining, was also destroyed, as well as other buildings. In addition to the destruction of the building and stock, the loss of books and papers is a serious one. The destruction caused by the fire is estimated to amount to about \$25,000, with an insurance of \$1000.

American Blower and Forge Company, Lancaster, Pa., issue a catalogue illustrating their different Forges and Blowers, Upright Hand Drill and New American Tire Bender. They call special attention to the Automatic Bell Traction Motion Blower, and point out the advantages possessed by it.

The Chalfant Mfg. Company, Atglen, Pa., illustrate in their catalogue the variety of goods in the Hardware line, with house-furnishing articles, Iron Toys and Floral and Garden Tools, which they manufacture. Sad Irons, a variety of Toilet and other special Irons, such as Druggists', Hatters', &c., Brackets, Soap Dishes, Dumb Bells, Foot Scrapers, Harness and other Hooks, Drawer Pulls, Chest Handles, &c., are thus represented.

The large Cabinet Hardware house of Gibson, Parish & Co., occupying the building at Nos. 78 and 80 Randolph street, Chicago, was totally destroyed by fire on the night of the 1st inst. The stock was worth about \$140,000. Of this between \$75,000 and \$80,000 was in Silk Plushes and Upholstery Goods, and the balance was composed of general Cabinet Hardware. The insurance amounted to about \$135,000, distributed among numerous companies, with policies ranging from \$2500 to \$5000. It will be seen, therefore, that the firm will be able to resume business without any difficulty as

soon as they can find a suitable location. They have established a temporary office at 84 Washington street, second story. It is probable that when they resume they may confine their attention exclusively to Cabinet Hardware. The firm consists of W. D. Gibson, Charles P. Parish and G. H. Luasky, who have been associated together for about eight years. They had occupied the building just burned for some six years.

The following personal items from Chicago are of interest: A. C. Bartlett, of Hibbard, Spencer, Bartlett & Co., has gone to Europe with his family, to be absent for several months. J. McGregor Adams, of the Adams & Westlake Company, is confined to his house with a sprained ankle, which has proved to be a very serious injury. Addison Kelley, of Kelley, Maus & Co., has gone to the Bermuda Islands for a vacation of a month or two. A. C. Mason, of the Mason & Davis Company, has taken a trip to California, combining business with pleasure. James H. Shields, of the Shields & Brown Company, is visiting New York in the interest of the firm. R. C. Hannah, of the North Chicago Rolling Mill Company, is now voyaging in the West Indies.

A copartnership is announced, under date January 23, between D. P. Hyatt, recently of the firm of Bacon, Flote & Co.; J. H. Matthews and A. P. Gahr, under the firm name of Hyatt, Matthews & Gahr, agents. Their offices are at 45 and 46 Mitchell Building, 99 West Fourth street, Cincinnati, Ohio. Their business is the sale of Iron and Steel manufactures, also Pig Iron, Iron Ores, Coke and Rails.

A fire at Lostant, Ill., which occurred on the 28th ult., destroyed a number of business houses, including the Hardware stores of Thomas Drew and Peter Martensen, who carried a stock of \$6000 to \$10,000 each, on which the press dispatches state there was no insurance.

Matthews & Willard Company, Waterbury, Conn., have announced, under date February 16, that, owing to temporary financial embarrassment, C. N. Wayland has been appointed receiver of the company. The object of this action was to keep the business alive in all its branches. They give assurance that orders will be filled with promptness and accuracy, and that the quality of the goods will be kept at a high standard and every effort made to introduce attractive novelties.

We are advised that C. O. Greene, of the late firm of Sheldon & Greene, who for the past four years has represented the Smith & Anthony Stove Company in the West, will for the present represent the Weir Stove Company in New York and surrounding States.

The Syracuse Fibre Ware Company, for whom W. A. Comstock is the Chicago manager, have secured a contract for furnishing the public school buildings of Chicago with water-pails to be used in case of fire. The contract calls for about 3000 pails. It was secured in the face of severe competition from the manufacturers of pails of all descriptions. The demand for ware of this character is growing rapidly, and while it is but natural that the approach of spring should quicken sales, yet the dealers see a larger growth than would reasonably arise from this cause, and they are looking forward to a heavy year's business.

Hughes & Otis, of Fond du Lac, Wis., have bought the stock of their chief competitor, the C. H. Benton Hardware Company, and now have the largest establishment in their line in that part of the State. They are pushing their business with vigor, as this absorption of a rival house well indicates.

The Holmes & Edwards Silver Company, Bridgeport, Conn., call special attention in their advertisement on page 78 to their Mexican Silver Spoons, Forks, &c. The point is made especially in regard to these goods that they resist the atmospheric influence better than any other metal goods in the market, while their other qualities make them very desirable. As there is no plate to wear off, any silver powder, chalk or electroline can be used to clean them, and it is said that in constant use they become even whiter and more beautiful.

The corporate name of the Strong-Hackett Hardware Company, Minneapolis, Minn., has been changed to the C. W. Hackett Hardware Company. Its officers are: C. W. Hackett, president; H. B. Gates, treasurer; and T. G. Walther, secretary.

E. C. Meacham Arms Company, St. Louis, Mo., issue in new and attractive style a catalogue of Athletic Goods, to which is prefixed a discount sheet for use of dealers and clubs only. The catalogue represents a variety of articles and machines for gymnastic exercise, including Chest Machines, Expanders and Developers, machines for different uses, such as exercising the leg, ankles, wrists, fingers, &c., Traveling Parallels, Rowing Machines, Horizontal Bars, Traveling Bars, Vaulting, Jumping and Climbing Apparatus, Boxing Gloves, Dumb Bells, Ten Pins, Garments for the gymnasium, &c. It will thus be seen that the catalogue is unusually interesting as relating to contrivances which are not often brought to the attention of the trade.

S. L. Allen & Co., Philadelphia, Pa., advise us that in addition to their distributing depots in Warren, Ohio, Detroit, Mich., Milwaukee, Wis., and St. Louis, Mo., they have established another distributing depot at Louisville, Ky., for the benefit of their trade in the Southwest, and they will hereafter be glad to make quotations on their goods at any of these points. Inquiries should be addressed to Philadelphia, as they make quotations and render all invoices from there.

The American Buckle and Cartridge Company, West Haven, Conn., for whom Alford & Berkeley Company, 77 Chambers street, New York, are agents, have recently bought the plant, tools, &c., of the American Gun Implement Company, and are busy placing the machines, &c., in their factory, so that in a short time they will be ready to make Brass Shells, Loading Tools, &c. They expect to continue manufacturing the Fowler brand of Brass Shells, and intend to furnish an article of superior quality. We are also advised that there is no foundation for the rumor which has prevailed more or less widely to the effect that they have been negotiating with the Ammunition Association for the sale of their plant.

The National Self-Heating Sad Iron Company, St. Louis, Mo., have removed from 109 North Sixth street to 1106 Pine street. In their new location they have considerable more working space, and are thus enabled to better handle the increasing trade which often taxed the capacity of their old quarters. Their showrooms are much larger and they have excellent shipping facilities in the rear. They report a steady increase in their trade, and have no reason to complain for want of orders.

The Kelly Barb Wire Company, of Chicago, are distributing a "Book of Valuable Information" among their customers, which comprises some 86 pages of miscellany on a multitude of interesting subjects. An accompanying circular calls attention to the Kelly Yielding Barb, which is the specialty of this company. While the fencing which they make is

REVISED SCREW LIST.

Iron Wood Screws.

March 1, 1889.

No.	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	20	22	24	26	28	30
In.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.
1/4	20	20	20	20	20																				
3/8	20	20	20	20	20	20	22	24	26	30															
1/2	20	20	20	20	22	24	26	28	33	37	42	45												
5/8	20	20	20	22	24	26	28	31	35	40	44	48	53	58										
3/4	20	22	24	26	28	30	32	36	41	46	50	56	62	75	85								
7/8	22	24	26	28	30	32	35	40	44	48	54	60	66	80	90								
1	27	28	30	32	34	38	42	46	52	58	64	72	83	95	110	130	150					
1 1/4	32	34	36	39	42	47	50	56	62	70	77	87	100	120	135	160	180	210			
1 1/2	37	40	44	47	50	54	57	64	70	80	87	97	110	130	145	170	190	220			
1 3/4	50	54	57	60	67	74	80	87	97	107	120	140	155	175	200	240				
2	64	67	70	74	77	80	87	94	105	115	127	145	160	190	225	260				
2 1/4	84	87	90	94	97	100	110	125	137	155	170	205	250	280					
2 1/2	97	100	104	107	110	115	120	135	147	165	180	220	270	310					
2 3/4					
3					
3 1/2					
4					
4 1/2					
5					
6					

Brass and Bronze Metal Wood Screws.

No.	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	20	22	24	26
In.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.
1/4	42	42	44	46	48																		
3/8	42	43	45	47	50	54	57	63															
1/2	45	47	49	54	57	64	69	79	88	99												
5/8	48	52	56	63	69	77	88	99	112	125	140										
3/4	56	58	60	67	75	84	98	111	126	140	158	175	195	215	237						
7/8	72	74	76	79	81	93	108	123	139	156	175	194	216	239	264						
1	81	84	86	88	102	119	135	153	172	192	214	238	263	290		348				
1 1/4	108	111	113	116	118	139	158	171	202	227	253	281	311	344	377	413	490			
1 1/2	149	152	154	156	159	181	207	234	263	294	327	362	400	440	481	571			
1 3/4	196	199	201	204	233	264	298	334	372	414	455	500	548	651	763	886		
2	252	254	256	259	261	296	335	375	417	463	511	561	616	730	856	994		
2 1/4	360	364	366	368	371	416	463	514	566	624	683	810	950			
2 1/2	499	501	504	506	508	564	623	684	751	891	1044	1210	
3	720	722	724	727	729	732	734	....	884	1050	1230	1426	1638

classed as Barb Wire, it is nevertheless a distinct type, the action of the barb constituting merely a prick and not a tear. The company claim that as a consequence of their barb yielding under pressure it can not seriously injure stock.

D. C. Baldwin, Lockport, Ill., has sold the greater part of his stock to O'Connell & Sloan, and rented to them his main store, where they will carry on the business. Mr. Baldwin has been in the Hardware trade 36 years.

The Taft Company, manufacturers of Wood Ornaments at Hartford, Conn., whose factory was destroyed by fire a few months since, have secured new quarters with greatly increased facilities, and are prepared to fill orders promptly.

A circular letter issued by the Cincinnati Corrugating Company refers to their Sheet-Metal Lath in the following terms: By improvements which we have made in the machinery and processes of manufacture of this Lath, we are now enabled to furnish it in the forms most approved by

the architectural profession and builders generally, and also at a price which will compare very favorably with the Wire Cloth or any other improved Lath now on market. Hence, as can be readily seen, there is a great advantage in the corrugated Metallic Lath as we now make it, on account of its great rigidity; the fact that it can be adapted to any kind of furring; to special curved surfaces, and between large spans where it would evidently be impossible to use the Wire Cloth. Another great advantage consists in the fact that it requires no stretching in putting on, which makes it very difficult to make a good job, unless by an expert in the business and very careful work. That is to say, it would be almost impossible with our Lath to slight work, as in the case of many other kinds.

Trade.

From Dudley Bros. & Lipscomb, Nashville, Tenn., we have the following review of the market:

Trade for 1889 has been better than for years past and continues good, though we think the open winter we have had has caused many of

the trade to buy their spring goods early, and this may affect sales later in the season. Prices have been maintained fairly well, though all our jobbers are selling at very close margins. The country generally is in good condition, and we do not hear much complaint in regard to collections. Steel Nails are worth \$2.10; Burden's Horseshoes, \$4.25; Galvanized Barbed Wire, 3 1/4 to 3 1/2 cents; Merchant Bar Iron, 1.85 to 2 cents. Macey & Co. have removed to the house recently occupied by J. H. Fall & Co. The latter parties have fitted up in another building on the same street one of the handsomest retail Hardware stores to be found anywhere. Our banks report an unusual surplus of money on hand. On the whole, we are hopeful for a prosperous year's business.

A recent issue of the Pittsburgh Dispatch, in an interview with a leading Hardware merchant of that city, gives the following expression of his views in regard to the situation and outlook:

The Hardware trade has undergone great changes in recent years, and the whole tendency has been toward lower prices, and as a consequence closer margins of profit. There are good and sufficient reasons for this downward drift of prices which has brought so many of our goods down to scarcely a living profit for manufacturers. In nearly every line business has been overdone. The prosperity of

Blake's Belt Studs.....	40&5 %
Oval Point Belt Hooks.....	75 %
Copper Rivets and Burrs.....	45 %
Smith Belt Fasteners.....	30 %
Round Belt Couplings.....	50&10 %
Belt Punches.....	20 %
Belt Awns.....	\$0.40 net.
Belt Cutters, Leather.....	25.00 "
Belt Cutters, Rubber.....	25.00 "
Hose Couplings, 1/4 inch, per doz.....	80 "
Balance.....	60&10 %
Hose Clamps.....	60&10 %
Hose Pipes, Screw Tip and Cook, large end.....	60&10 %
Lawn Sprinklers.....	50&10 %
Gem Nozzles, per doz.....	\$5.00
Magic Nozzles, 1/4 inch.....	\$12.00
Magic Nozzles, 1 inch, per doz.....	15.00
Fuller Nozzles.....	39 1/4 %
Hose Strap Fasteners, 1/4 to 1 inch, each.....	\$0.40
Hose Strap Fasteners, 1/4 to 1 1/4 inch, each.....	80
Hose Straps.....	45&5 %
Hair Felt, 1/4 inch, cut, per square foot.....	\$0.06
Hair Felt, 1/2 inch, cut, per square foot.....	06 1/4 %
Hair Felt, 1 inch, cut, per square foot.....	07
Empire Tin Elevator Buckets.....	40 %
Empire Iron Elevator Buckets.....	40 %
Acme Steel Cups.....	35 %
Excelsior Mill Elevator Buckets.....	50 %
Avery Seams.....	40&10 %
Corrugated Bolts, 1/4 to 1/2 inch, per 1000.....	\$5.50
Corrugated Bolts, 1 inch, per 1000.....	8.50
Hose Reels.	
Holly Hose Reel, No. 1.....	\$2.75
Holly Hose Reel, No. 2.....	3.50
No. 1 Success.....	1.10
No. 2 Success.....	1.60
Eureka Folding, No. 1.....	1.10
Eureka Folding, No. 2.....	1.60
Eureka Fixed Arms, No. 1.....	1.00
Imperial.....	75
Gauge Glass Washers, per doz.....	15
Rubber Cement.....	40&5 %
Leather Cement, per lb.....	\$0.60
Water Brass Goods.	
Compression Work.....	60 %
Key Work, rough.....	60 %
Key Work, finished.....	55 %
Cast Iron Sinks, painted.....	67 1/4 %
Steel Sinks, painted.....	37 1/4 %
Steel Sinks, galvanized.....	50&5 %
Globe Ventilators.....	45 %
Star Hydrant and Shoe Washers.....	60&10 %
Crescent Hydrants and Street Washers.....	70 %
Wood Pumps, Chain Pumps, &c.	
Wood Pumps, extra finish, revised list.....	60 %
Chain Pump Material.....	80 %
Chain.....	\$0.05
Victor's New Patent Bucket, per doz.....	1.00
Tubing, per foot.....	02 3/4 %
Iron Pumps.	
Cistern Pumps (Fig. 200).....	60 %
Pitchee Pumps (Fig. 205 1/2).....	75 %
Schrunkel's Piston Rod (Fig. 838).....	25 %
Set Length Lift Pumps.....	60&10 %
Force Pumps.....	60 %
Deep Well Standard.....	50 %
Double Acting Daisy Pumps.....	45 %
Iron Cylinders, except below.....	75&10 %
Brass Lined and Brass Body Cylinders.....	70&10 %
Cylinders (Fig. 615).....	60 %
Cylinders (Fig. 621).....	50 %
Foot Valves.	
Foot Valves, Figs. 371, 472, 473, 1 1/4 inch and smaller.....	60&10 %
2-inch and larger.....	50&10 %
Foot and Check Valves, Figs. 474, 475, 476, 50&10 %	
Foot and Check Valves, Fig. 637.....	60 %
Foot and Check Valves, Fig. 700.....	70 %
Foot and Check Valves, Fig. 742.....	80 %
Globe Strainers.....	40 %
Globe Strainers, Figs. 658, 659, 660.....	60&10 %
Float Valves.....	50 %
Copper Floats, each.....	\$0.65
Pump Rod, Drawn Steel, Special, 3/4 and 7-16, plain.....	00 3/4 %
Pump Rod, Drawn Steel, Special, galvanized, 3/4 and 7-16.....	04 1/4 %
Rod Couplings, plain, per lb.....	\$0.15
Rod Couplings, galvanized, per lb.....	18
Brass Rod Couplings, per lb.....	40 1/4 net
Gas Pipe Couplings and Guides.....	40 %
Well Points.	
Washer Points.....	70 %
Radial Center.....	50&10 %
Brass Jacket Points, 1 1/4 x 2 1/4 x 80 hole, Nos. 50 or 60, Gauge, per doz.....	\$7.50 net
Brass Jacket Points, balance of list.....	75 %
Drive Heads, Iron and Steel.....	25 %
Malleable Caps.....	50 %
Drive Head, Hardwood Caps.....	25 %
Goose Necks, Air Chambers and Cooks.....	50 %
Windmill Pumps.	
Windmill Lift Standards, except Fig. 702.....	60 %
Figure 702, No. 3; 1 1/4 x 6.....	\$2.25
Figure 702, No. 4; 1 1/4 x 6.....	2.50
Figure 702, No. 5; 1 1/4 x 6.....	2.75
Figure 702, No. 4; 2 x 10.....	2.75
Figure 702, No. 5; 2 x 10.....	3.00
Figure 700, Adj. Stroke (for Tubular Wells).....	8.25
Windmill Force Standards, except Figures 422 and 423.....	60 %
Figures 422 and 423.....	65 %
3-Way Pumps.....	60 %
3-Way Pumps, Figure 736, 6 inch, \$7.50; 10 inch.....	\$8.00
3-Way Pumps, Figure 791, 6 inch, \$7.00; 10 inch.....	\$7.50
3-Way Pumps, Figure 809; 1 1/4 x 6 inch.....	6.75
W. M. Working Heads.....	40 %
W. M. Heads, Figure 447, 60&10 %; 448.....	40&10 %
Double-Acting W. M. Pumps, Figs. 638 & 639.....	40 %
Syphon Working Barrels, Figs. 514 and 776.....	40 %
Well Pump Head and Deep Well Cylinder.....	30 %
Hand and House Force Pumps.	
Hand Force Pumps, Iron.....	50 %
Hand Force Pumps, Brass.....	45 %

Vertical Power Piston Pump.....	40 %
Globe Pump.....	25 %
Single-Acting House Force Pump, Iron.....	50 %
Single-Acting House Force Pump, Brass.....	50 %
Double-Acting House Force Pump, Iron.....	45 %
Double-Acting House Force Pump, Brass.....	40 %
Railroad and Ship Pumps.	
Star R. R. Force Pump.....	40 %
Meteor.....	45 %
Counter Shafts.....	25 %
Cornish Head.....	30 %
Deep Well Cylinders.....	30 %
Alert Double-Acting Pump.....	50 %
Challenge and Monitor Pumps.....	35 %
Alert Double-Acting Power Pump.....	40 %
Challenge Double-Acting Pulley Pumps.....	30 %
Brass Two-Cylinder Ship Pumps.....	30 %
Two-Cylinder Pumps, Iron.....	30 %
Deluge Bilge Pumps. See circular.....	30 %
Hand Boiler Feed Pump.....	40 %
Boiler Feed Pumps, except Figure 700.....	30 %
Figure 700.....	25 %

Rotary Pumps, &c.

Hand Rotary Pump.....	40 %
Hand Rotary Barrel Pump.....	35 %
Power Rotary Pump.....	40 %
Power Geared Rotary Pump.....	25 %
Portable Garden Pumps.....	50 %
Portable Force Pumps.....	35 %
Union Hand Engines, Special.....	40 %
Pacific Portable Force Pump.....	40 %
Brass Air Pump.....	40 %
Plumbers' Force Pump and Drip Pump.....	50 %
Air Pump.....	30 %
Beer Pump and and Test Pump.....	50 %
Hydraulic Rams.....	40 %

Bells, &c.

Meneely Pure Bell Metal Bells, per lb.....	28 1/2
Hangings, discount.....	20 %
Steel Amalgam Bells, Figure 758.....	70&10 %
Steel Amalgam Church Bells, Figure 33.....	40&10 %
Wrought-Iron Jack Screws.....	70&10 %
Cast-Iron Jack Screws, 8 x 24.....	\$1.75 net
Wrought-Iron and Cast-Iron Cider Press Screws.....	50 %
Pump Repairs.....	50 %

Exports.

PER SHIP WANDERING JEW, FEBRUARY 20, 1889, FOR MELBOURNE, AUSTRALIA.

By Healy & Earl.—5 cases Sawmills, 4 cases Grain Mills, 48 dozen Axes.	
By J. W. Horton & Son.—264 dozen Axe and Pick Handles.	
By Holmes, Booth & Haydens.—16 packages Lamp Goods.	
By Reed & Barton.—484 pounds Plated-Ware.	
By Lalanc & Grosjean Mfg. Company.—695 pounds Household Utensils.	
By Rogers Locomotive and Machine Works.—16,422 pounds Locomotive Machinery.	
By G. P. Patterson.—2766 pounds Cordage, 589 pounds Cordage.	
By Simpson, Hall, Miller & Co.—11 cases Plated-Ware.	
By Collins Company.—100 dozen Edge Tools.	
By Parker & Whipple Company.—105 pounds Clocks, 105 Clocks.	
By W. K. Freeman.—800 dozen Axe Handles, 100 cases Axe Grease.	
By Welsh & Lea.—10 cases Iron Bolts, 1 case Carpet Sweepers.	
By Waterbury Clock Company.—58 cases Clocks, 3 cases Clocks.	
By Ansonia Clock Company.—91 boxes Clocks, 40 boxes Clocks.	
By Yale & Towne Mfg. Company.—856 pounds Locks.	
By Edward Miller & Co.—40 packages Lamp Goods, 33 packages Lamp Goods.	
By New Haven Clock Company.—288 Clocks.	
By Hand Drill Company.—4 boxes Drilling Machine.	
By W. & B. Douglas.—5 boxes, 2 casks Pumps.	
By Meriden Britannia Company.—9 packages Plated-Ware, 20 packages Plated-Ware, 3 boxes Plated-Ware, 3 boxes Plated-Ware.	
By Russell & Erwin Mfg. Company.—11 cases Hardware, 42 packages Hardware.	
By Winchester Repeating Arms Company.—2 cases Guns, 1 case Tools, 22,000 Cartridges.	
By Manhattan Brass Company.—20 cases Lampware, 42 barrels Lampware, 2 cases Brass Goods.	
By H. W. Johns Mfg. Company.—1014 pounds Asbestos Packing, 198 gallons Varnish, 100 gallons Liquid Dryer, 560 pounds Asbestos Packing.	
By Strong & Trowbridge.—5 crates Stoves, 4 cases Whetstones, 6 packages Grindstones and Parts, 1 case Lead Pencils, 1 case Forks.	
By Woodhouse & Stortz.—20 dozen Edge Tools, 1085 pounds Hardware, 202 pounds Electro-Plated Ware.	
By F. B. Wheeler & Co.—27,000 pounds School Slates, 6 sets Harness, 8 1/2 dozen Hardware, 6 dozen Axes, 8 cases Hardware.	
By Isley, Doubleday & Co.—1 case Hardware, 224 pounds Glue, 4 1-6 gross Glue.	
By Maillet & Queveau.—3 cases Hardware, 600 cases School Slates.	
By Arkell & Douglas.—77 cases Handles, 120 dozen Handles, 2 cases Spokes, 3 casks Pumps, 1 case Wrenches, 2 dozen Forks, 3 cases Castings, 23 dozen Locks, 8 packages Hardware, 2 barrels Castings, 69 cases Slates, 5 1/4 dozen	

Velocipedes, 200 boxes Clothes Pins, 36 dozen Towel Rollers, 7 boxes Shade Rollers, 28 dozen Lampware, 2 boxes Hoes, 2 boxes Tools, 1 dozen Clamps, 1 box Harness, 4 dozen Hammocks, 13 boxes Axes, 27 boxes Hardware, 3000 pounds Nails, 12 dozen Hoes, 48 dozen Lamp Goods, 1 box Handles, 1 case Drills, 2 cases Cages, 1/2 dozen Scales, 5 cases Hardware, 358 pounds Cord, 27 dozen Saws, 26 dozen Staples, 600 pounds Nails, 7 dozen Locks, 2 cases Tools, 500 feet Hose, 8826 pounds Bolts, 12 cases Handles, 6 nests Tubs, 6 nests Pails, 5 boxes Tools, 2 cases Hardware, 3 cases Axes, 6 dozen Saws, 7 packages Hardware, 3 dozen Tacks, 12 dozen Wire Goods, 1 case Wire Cord, 1/2 gross Axle Grease, 2 cases Hardware, 3 cases Wrenches, 2 cases Wire Goods, 3 cases Tinware, 6 dozen Oil Stoves, 2 cases Tools, 14 Ranges and 1 box Parts, 100 boxes Clothes Pins, 12 dozen Hoes, 270 pounds Tools, 3 dozen Braces, 12 1/2 dozen Braces, 4 dozen Axes, 111 pounds Wagon Springs, 1 case Bolt Cutters, 16 dozen Stump Joints, 18 gross Hardware, 1/2 gross Shoe Blacking, 7 boxes Tools, 2 crates Mail Boxes, 1 case Chalk, 14 Oil Stoves, 6 dozen Bench Screws, 1 case Bolts, 3 dozen Axes, 6 dozen Hoes, 2 dozen Choppers, 2 cases Bolts, 3 cases Carriage-Ware, 5 cases Hubs, 1 case Whiffletree, 3 Pumps, 2 dozen Sinks, 1/2 dozen Lawn Mowers, 18 boxes Tools, 4 packages Hardware, 10 cases Axes, 4 cases Tools, 100 dozen Bolts, 1 dozen Grindstones, 1 crate Carriage-Ware, 2 cases Springs, 1 case Bolts, 3 cases Carriage-Ware, 1 case Drills, 1 case Bolts, 1 case Tools, 90 dozen Whips.	
By W. H. Crossman & Bro.—125,000 Blasting Caps, 50 dozen Axes, 1 box Stove Parts, 12 dozen Traps, 34 dozen Whisk Brooms, 14 cases Hardware, 310 Clocks, 3 gross Lead Pencils, 27 dozen Wrenches, 12 dozen Hammers, 2 dozen Meat Choppers, 32 cases Nails, 39 dozen Traps, 24 dozen Thermometers, 16 dozen Stencils, 6 dozen Oil-Ra, 18 dozen Curry Combs, 1 case Tools, 1 1/2 dozen Mallets, 1/2 dozen Emery Grinders, 16 dozen Hardware, 1 dozen Meat Choppers, 6 dozen Sives, 10 dozen Reflectors, 1/2 dozen Wringers, 26 cases Hardware, 24 dozen spools Wire, 5 dozen Wooden Faucets, 28 Churns, 1 barrel Lamp Goods, 6 dozen Mattocks, 3800 pounds Nails, 5 gross Shade Rollers, 10,000 Paper Shells, 12,000 Loaded Shot Shells, 123 dozen Axes, 16 dozen Axes, 2 gross Whips, 15 dozen Padlocks, 66 dozen Axes, 12 dozen Hoes, 374 dozen Handles, 228 pounds Tacks, 2 dozen Axes, 2 packages Blocks, 2 cases Tools, 48 pairs Skates, 4 dozen Axes, 1 box Hardware, 32 packages Pumps and Parts, 7 Clocks, 1 box Hardware, 1 case Hardware, 5 1/2 dozen Iron Wagons, 3 cases Hardware, 2 1/4 gross Glue, 1 box Hardware.	
By R. W. Forbes & Son.—3500 pounds Nails, 1 dozen Tubs, 21 dozen Forks, 12 dozen Brush Holders, 5 dozen Hinges, 1 dozen Saws, 1 case Stamped-Ware, 4 gross Rollers, 2 packages Lampware, 3 1/2 dozen Rakes, 3 dozen Lemon Squeezers, 12 packages Hardware, 11 boxes Wringers, 1 case Hardware, 2 packages Hardware, 2 boxes Hardware, 19 packages Hardware, 4 dozen Glue, 181 sets Axes, 3593 pounds Carriage Bolts, 49 packages Hardware, 36 dozen Forks, 4 packages Lawn Mowers, 6 packages Plated-Ware, 11 cases Wringers.	
By R. W. Cameron & Co.—7 cases Saws, 6 cases Axes, 15 cases Axes, 54 cases Axes, 1 box Hardware, 4 packages Drill Machinery, 15 Axes, 2 cases Malleables, 10 cases Spokes, 1 case Pick Handles, 33 Bundles Rough Handles, 1 crate Tills, 6 cases Hardware, 2 barrels Chimneys, 3 cases Spring Rollers, 3 cases Whip Handles, 6 cases Velocipedes, 120,000 Slates, 1 box Hardware, 15 boxes Bolts.	
By A. Field & Co.—15 gross Hinges, 3 gross Hooks, 3 1/2 dozen Locks, 650 pounds Nails, 2 dozen Wringers, 3 dozen Hammers, 18 dozen Axle Grease, 2 gross Varnish, 3 dozen Brushes, 1 1/2 gross Axle Grease, 2 dozen Tools, 3 dozen Harness-Ware, 7 dozen Axes, 34,000 Bolts, 13 dozen Hardware, 18 dozen Axle Grease, 1 gross Varnish, 1 1/2 gross Harness Dressing, 11 1/2 gross Hardware, 12 dozen Whips, 2 gross Harness Dress, 5 dozen Harness Parts, 6 dozen Brushes, 60 pounds Rivets, 122 dozen Harness-Ware, 2 dozen Harness-Ware, 13 1/2 dozen Harness-Ware, 8 dozen Harness-Ware, 3 cases Axle Grease.	
By McLean Bros. & Rigg.—16 Dies, 4 dozen Miter Boxes, 18 dozen Plumbs and Levels, 1 1/2 dozen Chain Wrenches, 21 dozen Coffee Mills, 1 dozen Sad Irons, 8 dozen Meat Choppers, 11 cases Gate Latches, &c., 3 dozen Lamp Reflectors, 180 dozen Burners, 2 1/2 dozen Boring Machines, 82 dozen Locks, 12 dozen Saw Sets, 18 dozen Lamp Goods, 9 dozen Guns, 14,000 Cartridges, 24 Churns, 27 dozen Brackets, 300 dozen Locks, 6 dozen Molasses Gates, 44,000 Bolts, 11 packages Lampware, 1 case Sewing Machine Parts, 110 dozen Hay Forks, 24 dozen Gate Latches, 150 dozen Brackets, 1 dozen Miter Boxes, 39 dozen Wrenches, 10 Stoves and Parts, 76 dozen Saws, 1/2 dozen Guns, 1/2 dozen Wheel-	

barrows, 1 dozen Wringers, 10 dozen Axes, 1 dozen Knives, 60 sets Axes, 1 dozen Spirit Levels.

By Morris, Strouse & Co.—1½ dozen Wringers, 12 dozen Mop Sticks, 68 dozen Edge Tools, 14 gross Kitchen Tools, 36 dozen Iron Tacks, 92 dozen Axes, 30 dozen Hardware, 6 dozen Grindstones and Fixtures, 46 dozen Mouse Traps, 3 gross Tools, 6 gross Shade Rollers, 108 dozen Tools, 1 dozen Money Drawers, 70 dozen Tools, 3 gross Brooms.

By Coombs, Crosby & Eddy.—2400 pounds Nails, 2 Printing Presses, 1 case House-Furnishing Goods, 92 dozen Handles, 2 dozen Wringers, 5 dozen Rakes, 1386 pounds Screws, 6 dozen House-Furnishing Goods.

By H. W. Peabody & Co.—44,803 pounds Barb Wire, 5 packages Hammocks, 2000 pounds Nails.

PER SCHOONER SEVERN, MARCH 2, 1889, FOR EAST LONDON.

By Carey, Yale & Lambert.—1200 feet Sash Cord, 1850 pounds Sash Weights.

By W. H. Crossman & Bro.—62 cases Flow Parts.

By Arkell & Douglas.—40 dozen Axes, 6 cases Agricultural Implements, 1 case Shares, 15 cases Plows, 1 case Slate Pencils, 125 kegs Nails, 230 cases Agricultural Implements, 40 dozen Axes, 39 cases Agricultural Implements, 198 cases Agricultural Implements, 1 barrel Sash Cord, 30 dozen Handles, 50 dozen Axes, 7700 pounds Sash Weights, 20 Pumps, 8 cases Scales, 26 cases Plows, 1½ dozen Clocks, 64 cases Plows, 4 cases Sewing Machines, 60 dozen Picks, 5 Carriages, 26 dozen Picks, 5 Carriages, 4 cases Axes, 6 cases Spokes, 12 dozen Picks, 1 case Hay Forks, 1 case Slate Pencils, 1 case Carriage-Ware, 1 bale Sash Cord, 760 pounds Sash Weights, 3 Carriages, 1 Carriage, 15 cases Plows, 10 kegs Nails, 20,000 pounds Wire, 760 pounds Sash Weights, 1 Carriage, ½ dozen Hardware, 1 dozen Churns, 1½ dozen Saws, 6 dozen Brooms, 1 case Hardware, 3 dozen Tools, 1 case Cages, 2 dozen Wheels, 3 cases Varnish, 100 pounds Oil Stones, 1 case Planes, 6 packages Mills, ½ dozen Mangles, 1 dozen Wringers, ½ dozen Washers, ½ dozen Churns, 37 packages Rims, &c.

By W. H. Crossman & Bro.—4 dozen Axes, 300 dozen Handles, 48 dozen Handles, ½ dozen Braces.

No Trusts for Kansas.—The Kansas Senate has passed the bill to prevent trusts, combinations and pools, and it becomes a law. It provides that all arrangements, contracts, agreements, trusts or combinations between persons or corporations, made with a view or which tend to prevent full and free competition in the importation or transportation of articles imported into that State, or in the product, manufacture and sale of domestic raw materials, or for the use of money, or to fix attorney's fees, and all arrangements, trusts or combinations between persons or corporations designed or which tend to advance the cost to the consumer of any such articles, or which tend to advance or control the rate of interest for the loan or use of money to the borrower, are declared to be against the public policy, unlawful and void. The bill provides a penalty of imprisonment and a fine not to exceed \$1000 for violation.

The trial of the compound locomotive Pennsylvania was made a few days since in the Altoona yards. This engine was built after designs by F. W. Webb, mechanical engineer of the London and Northwestern Railroad, at the works of Beyer, Peacock & Co., Manchester, England, and was assembled at the Altoona shops. In this engine the inventor endeavored not only to secure the economical advantages of the compound principle, but also to obtain the adhesion of four drivers without using parallel rods. Although the test was satisfactory, there are some improvements needed before the Pennsylvania company will order more engines to be built after the same pattern.

Contracts aggregating \$600,000 have been let for the construction of the Ohio connecting railway bridge across the Ohio River at Brunot's Island, a few miles below Pittsburgh. The successful bidders

are Pittsburgh firms, and they have orders to commence work at once. The building of the bridge will be under the supervision of Chief Engineer M. J. Becker, of the Pittsburgh, Cincinnati and St. Louis Railway. It is expected to be finished in about a year. The bridge proper will be a mile long, approached by an iron viaduct 700 feet in length.

The Reading Failure.

The suspension of the Reading Iron Works, one of the largest concerns of the kind in Pennsylvania, has been announced. The works are located in Reading, and are owned by a stock company. The company have issued \$250,000 first mortgage and \$150,000 second mortgage bonds. In addition to this, there is \$500,000 of preferred stock and \$500,000 of common. The floating debt is said to be heavy. About 2500 men are employed in the works at Reading. There are three rolling mills, a steam forge, a large machine shop and foundry, a rail works, and one of the largest pipe mills in the country.

The works were originally owned by Seytert, McManus & Co. The firm failed some years ago, and the creditors then organized and decided to continue the business under the title of the Reading Iron Works. John Penn Brock was elected president and Edward W. Coit general manager. Mr. Brock died about eight years ago, and was succeeded by Mr. Coit, who has since been the executive head of the company. Shortly after the organization of the company there was some trouble caused by business depression, and an extension was asked for and granted. A portion of the indebtedness was paid in cash and a portion in preferred stock. The company continued to do business after the settlement was made, and, under Mr. Coit's management, enjoyed a period of prosperity; but dullness in the trade and shrinkage in prices finally overwhelmed it. A meeting of the creditors will be held in Philadelphia on Thursday.

Later dispatches announce that the rolling mills at Naomi and Gibraltar, near Reading, the greater portion of whose products were received by the Reading Iron Works, closed down for want of orders, and the Keystone Rolling Mill, at Reading, whose entire product is taken by the Reading Iron Works, also shut down.

Orders have been issued by the Reading Railroad Company stopping the shipment to the Reading Iron Works of coal, lime, ore, iron, &c, from the mines, furnaces and kilns controlled by the railway company. The works were running as usual on Wednesday.

An Important Ruling in Commercial Law.

The opinion handed down on the 5th inst. by the United States Supreme Court in the case of the Liverpool and Great Western Steamship Company is one of special interest to the world. The question involved was whether a steamship company can limit its liability for its own negligence. The decision of the court is that it cannot. In this case the company had stipulated in its bills of lading that it should not be liable for the negligence, default or error in judgment of the navigators of the vessel. The vessel was stranded on the coast of Wales. On the trial in the lower court it was found that the stranding was due to negligence on the part of the vessel's officers. The company then claimed that even in that case it was exempt from liability by the express stipulation in its bills of lading. The Supreme Court holds that the stipulation was not valid in law, for the reason that

no steamship company nor any other common carrier has any right or power make such a condition. The court says:

No public carrier is permitted by law to stipulate for an exemption from the consequences of negligence. The fundamental principle upon which the law of common carriers was established was to secure the utmost care and diligence in the performance of their duties. A carrier who stipulates not to be bound to the exercise of care and diligence seeks to put off the essential duties of his employment. Nor can those duties be waived in respect of the servants of the common carrier, especially where the latter is incapable of acting except through others. To admit such a proposition as that the law merely demanded abstract carefulness and diligence in proprietors and stockholders who take no active part in the business would be subversive of the very object of the law.

The court further holds that English law cannot make such a stipulation valid in case of a contract made in this country, for in such case our own law governs. "The fact that the vessel went ashore on the coast of Great Britain is quite immaterial." This decision will have a revolutionary effect on both ocean and land bills of lading. It will make a dead letter of the clause exempting the company from liability for its own negligence.

The Brunot's Island Bridge.—Contracts have been let for the erection of the Ohio connecting railway bridge across the Ohio River, at Brunot's Island, a few miles below Pittsburgh. The contracts amount to \$600,000, and have all been awarded to Pittsburgh parties. The Keystone Bridge Company have the contract for the ironwork. The work will be under the supervision of Chief Engineer M. J. Becker, Pittsburgh, Cincinnati and St. Louis Railway. The bridge will consist of two deck spans, each 121 feet long, over the Chartiers turnpike; eleven deck spans, each 171 feet long over Brunot's Island; two channel spans, one 416 and the other 425 feet long; one span over the Pittsburgh and Western road of 137 feet; two spans over the Fort Wayne yards 150 feet in length each, and one iron viaduct 700 feet long, paralleling and gradually sloping to the grade of the Fort Wayne road. The object in erecting this bridge is to permit the transferring of freight by the Pittsburgh, Cincinnati and St. Louis and the Pittsburgh, Fort Wayne and Chicago Railway lines without having to haul the freight to Pittsburgh, and making the transfer in that city, as is the case at present.

A committee representing 5000 working engineers, members of the five principal stationary engineers' associations in this city and Brooklyn, called on Mayor Grant and filed a protest against the practice, lately begun, of persons contracting to run the boilers and steam apparatus in factories and office buildings and employing incompetent men. They declare that the steam-heating apparatus in many of the public schools is in inefficient hands, and that generally the public is exposed to the danger of being blown up in offices and factories, and even in the streets, whose sidewalks cover many mismanaged boilers. They ask that the law requiring that all boilers be tested and all engineers be licensed after a thorough examination be rigidly enforced.

We understand that two of the rail mills, the Lackawanna Coal and Iron Company and the Edgar Thomson Steel Works, are preparing to add another converter to their plant.

Howard Burden has recently become president of the Hudson River Iron and Ore Company, at Burden, N. Y. We understand that the question of putting up a modern furnace is under consideration by this company.

The Empire Window Screen.

This article is manufactured by C. J. Sherriff & Co., Morristown, N. Y., for whom C. F. Guyon & Co., 99 Reade street, New York, are agents. A general view of the screen is given in the accompanying illustration, Fig. 1, and a view of the fly-escape is given in Fig. 2. These window screens are made of maple or birch finished in the natural color, and are referred to as strongly as well as neatly constructed. The corners are double-mortised and glued, and not simply wire-nailed, as others. The manufacturers call special attention to the fact that the wire screen is tightened perfectly smooth by having inlaid wood strips nailed into the frames through the

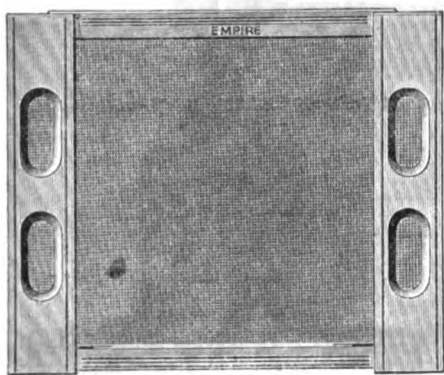


Fig. 1.—The Empire Window Screen.

entire length. The screen is made with an automatic spring adjustment by which the side pieces are pressed outward, making them fit snugly in the window. The screens are also made with metallic slides, the advantage of which, as not effected by dampness, is alluded to. It will be observed that the sides or extensions are paneled, thus admitting more light and air than when made solid. Fig. 2, which represents the fly-escape, shows the outside of the screen as it is placed in the window. It will be seen that above the wire cloth are small openings made by the curves in the upper part of the outside piece of the frame, permitting the flies going up on the wire cloth to pass under



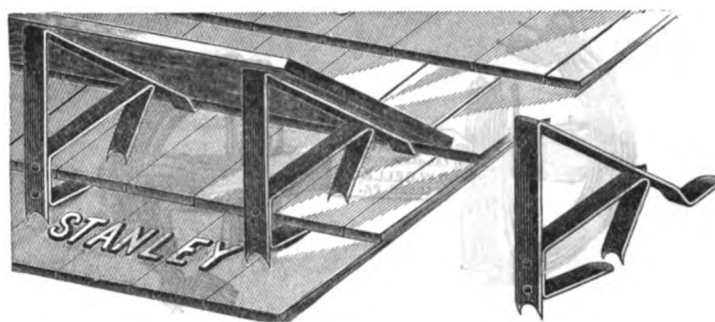
Fig. 2.—Fly-Escape.

the inner upper piece of the frame, and out through the aperture thus afforded. The point is made that they will thus make their escape from the room, while at the same time there is no likelihood of their entering through these openings.

Stanley's Patent Roofing Bracket.

Our readers will be interested in the illustration we give of a new device for supporting stagings on a roof. Two brackets are represented in position for use, and another one is shown detached. The material used in constructing the bracket is spring steel, and the parts are riveted together at a point near the base. The two beveled ends can be inserted under two layers of shingles, already laid, and any pressure from above will then fasten both sets of prongs firmly on the roof. Steel spurs which project from the upper bearing surface of the bracket will secure the staging boards in place. It is claimed that one dozen per minute can be put in position or released, and that no nail-holes are left in the roof, a further

advantage being that the brackets are always ready for use, and afterward can be dropped from a roof to the ground without fear of breaking. The manufacture of these goods by the Stanley Rule and Level Company, of New Britain, Conn., has recently been undertaken, and they



Stanley's Patent Roofing Bracket.

report a good demand for the brackets, as also favorable testimonials from carpenters and painters who have already used them.

The Brock Patent Chain Pipe Wrenches.

J. H. Williams & Co., 9 to 15 Richards street, Brooklyn, N. Y., manufacturers of the Brock patent chain pipe wrenches and of other drop-forged specialties, have recently purchased a testing machine from the well-known house of Tinius Olsen & Co., Philadelphia, for the especial purpose of testing the material used in their chain wrenches, as well as the wrenches themselves after assembling. The capacity of this machine is 30,000 pounds, and its owners inform us that not only will all the

blanks and machine handles. Their already extensive line of engineers' wrenches has been enlarged until it now contains all sizes from $\frac{1}{4}$ inch to $2\frac{1}{2}$ inches, the most recent additions being wrenches for 2-inch and $2\frac{1}{2}$ -inch bolts. They carry a large stock of all their products, having constantly on hand 50,000 wrenches of 90 different kinds and 75 different sizes of thumb-screw blanks.

C. A. Maynard's Handled Planters' and Field Hoes.

Robert Murray, 24 Duane street, New York, sole agent for these goods, is now offering them to the trade. It will be observed from the illustrations given that these hoes are so constructed that the head can be



Fig. 1.—A New Hoe.

Brock chain wrenches hereafter made be carefully tested with this apparatus, but that all the material intended for these goods will be subjected to careful trial in the same manner, and its tensile and transverse strength accurately gauged before it is allowed to be made up into the tools. The latest improvement in the Brock chain wrenches, which are manufactured solely by the above firm, is the patent steel safety link now applied to all the sizes. This invention for attaching the chain to the wrench is covered by United States letters patent No. 377,795, granted February 14, 1888, and is re-

readily detached from the handle, thus greatly facilitating the shipping, reducing freight and making the goods more convenient to store. Fig. 1 shows the hoe complete and ready for use, and Fig. 2 the separate parts of which it is made. It will be seen that the blade is a sheet of steel which is attached to the handle by means of a large-headed bolt which passes through it and enters the ferruled end of the handle, in which it is securely fastened by the keys. The utility of this construction is obvious, and the excellence of the material and workmanship is also referred to by the manufacturers. The



Fig. 2.—Parts of Maynard's Handled Hoes.

garded as a most valuable improvement. The object of this addition is to render it impossible for the chain to break away from the jaws, and the great defect existing in other chain wrenches is thereby avoided. The addition of the safety link does not affect the reversibility of the tool, and all sizes are interchangeable as hereto-

planters' hoes are made with polished or unpolished blades, and the field hoes with polished blades.

The reduction works completed at Deadwood, Dak., two months ago at a cost of \$90,000, were destroyed by fire 1st inst.

Bell's Eave-Trough Hanger.

Messrs. John W. Bell & Co., of Mercer, Pa., are directing the attention of the trade to what is known as Bell's eave-trough hanger, made of a single piece of galvanized wire. The statement is made that this hanger will not corrode, nor cause the trough to rust. It can be fast-

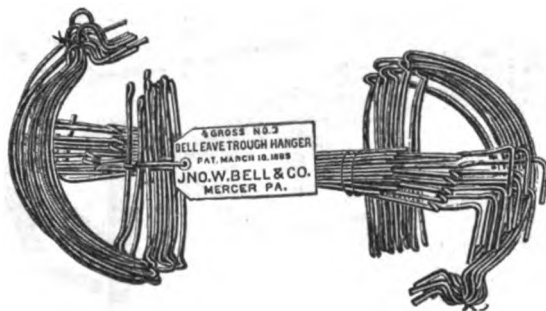
to it two uprights of the same material. Secured to these uprights is an adjustable picket-rest with movable gauge. The iron knife bar, or lever, which is provided with a wooden handle, is attached at its lower extremity to the base by means of a hinged joint, which serves as a fulcrum. The manufacturers state that the knife-holder is adjustable upon the knife-bar, and causes the

size has a range of from $\frac{1}{4}$ to 2 inches, and weighs complete 12 pounds. The strength of this pipe-vise, as well as the low price at which it is sold, are also alluded to.

Reading Hardware Company.

From a late issue of the Reading (Pa.) *Times* we take the following description of the new works of the Reading Hardware Company, located in that city, and which are fast approaching completion:

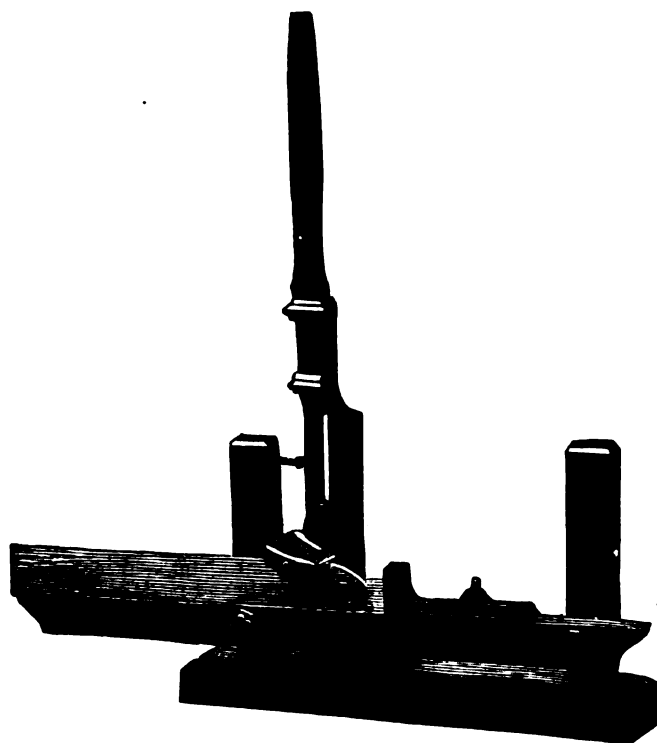
The finishing touches are now being given to the new buildings of the Reading Hardware Company by the carpenters, and by the middle of April the remembrance that the destruction of the old works was the most serious conflagration in the history of Reading will be drowned in the hum of new and improved machinery, and the noise of 700 busy workmen.



The Bell Eave-Trough Hanger as Put Up for Shipment.

ened to the trough while it is on the ground, the operation consisting simply of closing down the hook with a pair of 8-inch gas pliers. When the trough is elevated to its place the hangers may be bent and adjusted to the pitch of the roof in order to give the trough the proper fall. This hanger is claimed to form a complete brace and support to the trough, and to hold it not alone in its proper position but in shape as well. It is easily and quickly adjusted, and is meeting with a great deal

knife to stand at right angles to the bar. The knife is attached to the lever by screws, clearly shown in the cut. When operating the machine, it is only necessary to place a picket on the rest, as indicated in the engraving, push the lever forward, and the work is done. The lever is thrown back into its original position by a spring suitably placed. The makers state that, when desired, they furnish with the machine a miter attachment designed for cutting or pointing ends of shingles. When



Hand Picket Pointer, Made by I. S. Spencer's Sons.

of favor. The hangers are put up in packages of two dozen each, the engraving presented herewith showing the appearance of a bundle of hangers ready for shipment. The firm state that their sales last year were double those of any other season, and the prospects for 1889 are promising.

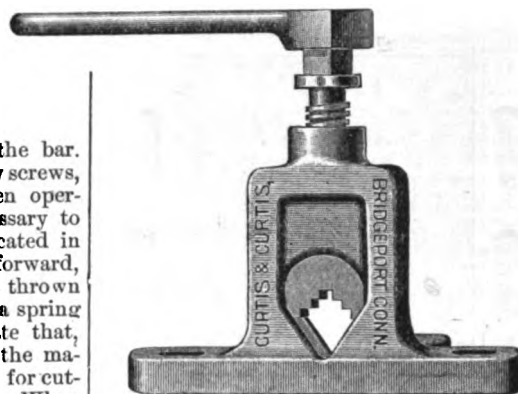
Hand Picket Pointer.

Messrs. I. S. Spencer's Sons, of Guilford, Conn., are introducing to the building trades a device for shaping the tops of pickets, a general view of the machine being afforded by means of the accompanying illustration. It is known as a hand picket pointer, and is provided with a base made of hard wood, having firmly fastened

this attachment is used, it is fastened to the picket-rest in the place of the gauge.

A New Pipe-Vise.

Curtis & Curtis, manufacturers of the Forbes patent die-stock and pipe cutting and threading machinery, Bridgeport, Conn., are putting on the market the pipe-vise which is illustrated herewith. It is described as made of the best malleable iron and steel. The lightness of the contrivance is referred to by the manufacturers as making it very convenient for carrying in the tool-chest or pocket. The smaller size, which is represented in the cut, weighs complete $2\frac{1}{2}$ pounds, and has a range of from $\frac{1}{4}$ to $\frac{1}{2}$ inch inclusive. The larger



A New Pipe Vise.

Bins and boxes are now being put in the storehouse, which is that portion on Sixth street and extending back almost to and connected with the factory buildings by an iron bridge, for the storage of the various kinds of manufactured articles. The whole arrangement is being made in accordance with the most modern plans adopted by similar establishments, with original modifications and improvements by the proprietors of the works. In the warehouse five floors are utilized, and by the use of two Stokes & Parrish elevators the goods are quickly handled from one floor to another. The elevators are run by a pressure valve with steam from the factory boilers. In the cellar, which has one of the best cement floors, the heavy goods are principally kept. On the first floor is the office and shipping department. When completed the office will be inclosed by a railing and glass partitions, and will be light and roomy, much to the pleasure and satisfaction of the score of bookkeepers. It is supplied with finely finished ash and walnut desks, and two stenographers are kept busy receiving the dictation of many letters daily. The second floor is where the fine bronze plated metal and brass ware is stored. On the fourth the packing is done, and on the fifth the paper boxes are stored. Over 100,000 of these were in the building when it was burned down. The company will hereafter manufacture their own boxes.

The warehouse and factory are connected by a covered iron bridge made by Coffrode & Saylor, of Pottstown, and as the goods are finished in the factory they are at once sent across the bridge to the proper wareroom. The factory and japan house, which is the department where the danger from fire usually exists, has been so constructed in the new building as to make a conflagration through it only a possibility. It is of the safest and best design, with the fire on the ground floor and the ovens on the second. The factory is also supplied with an immense vault, extending from the first to the fourth floors, in which fine tools, dies, &c., are to be stored. The company suffered a heavy loss from the destruction of fine tools at the time of the fire. The floors are all of double thickness, and all the doors and windows are covered with a casing of tin as an additional precaution against fire. An important precaution was also taken in the boiler-house by the building of a belt well, which would prevent a fire in the main shaft from spreading. The new buildings will be completed probably by the 1st of April, and when all departments are in full operation again between 700 and 800 hands will be employed.

The new French cable to Hayti, San Domingo and cities in Venezuela is now open for service.

CURRENT HARDWARE PRICES.

MARCH 6, 1889.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers, at the figures named.

Ammunition.—

Caps, Percussion, 1000—	
Hicks & Goldmark's	
F. L. Waterproof, 1-10's.....	50¢
E. H. Trimmed Edge, 1-10's.....	25¢
E. B. Grnd. Edge, Cent. Fire.....	25¢
Double Waterproof, 1-10's.....	75¢
Double Waterproof, 1-10's.....	1.10
Market Waterproof, 1-10's.....	50¢
G. D. B.....	25¢
S. B.....	30¢

Union Metallic Cartridge Co.	
F. C. Trimmed.....	50¢
F. L. Ground.....	25¢
Cent. Fire Ground.....	25¢
Db. Waterproof.....	75¢
Db. Waterproof, in 1-10's.....	1.10
S. B. Genuine Imp.orted.....	45¢
Eley's E. B.....	54¢
Eley's D Waterproof, Central Fire.....	1.00

Rim Fire Cartridges.....	50¢
Rim Fire Military.....	15¢
Cent. Fire, Pistol and Rifle.....	25¢
Cent. Fire, Military and Sporting.....	15¢
Blank Cartridges, except 22 and 32 cal., additional 10¢ on above discounts.....	2¢
Blank Cartridges, 22 cal.....	1.75
Blank Cartridges, 32 cal.....	3.50
Primed Shells and Bullets.....	15¢
R. B. Cape, Round Ball.....	1.75
R. B. Cape, Con. Ball, Swgd.....	2.00

Primers.....	
Berdan Primers.....	1.00
B. L. Cape (for Sturtevant Shells).....	1.00
All other Primers.....	1.30

Shells.....	
First quality, 4, 8, 10 and 12 gauge.....	25¢
First quality, 14, 16 and 20 gauge.....	30¢
Star, Club, Rival and Climax brands, 10 and 12 gauge.....	35¢
Star, Club, Rival and Climax brands, 14, 16 and 20 gauge.....	35¢
Seibold's Comb. Shot Shells.....	15¢
Brass Shot Shells, 1st quality.....	60¢
Brass Shot Shells, Club, Rival, Climax.....	65¢
I. X. L. 10 and 12 gauge.....	40¢
"Special," 16 gauge.....	30¢
"Special," 10 and 12 gauge.....	40¢
Fowler's Pat.....	3.25

Shells Loaded.....	
A. M. Co. List No. 19, 1887.....	30¢

Wads.....	
U. M. C. & W. R. A.—B. E., 11 up.....	2.00
U. M. C. & W. R. A.—B. E., 9&10.....	2.50
U. M. C. & W. R. A.—B. E., 7&8.....	3.00
U. M. C. & W. R. A.—P. E., 11 up.....	3.10
U. M. C. & W. R. A.—P. E., 9&10.....	4.00
U. M. C. & W. R. A.—P. E., 7&8.....	4.90
Eley's B. E., 11 up.....	1.75
Eley's P. E., 11 up.....	2.80

Anvils.....	
Eagle Anvil, 10".....	20¢
Peter Wright's.....	95¢
Armstrong's Mouse Hole.....	1.10
Armstrong's Mouse Hole, Extra.....	1.10
Trenton.....	95¢
Wilkinson's.....	95¢
J. & Riley Carr, Pat. Solid.....	1.10
Moore & Barnes Mfg. Co.....	33¢

Anvil Vise and Drill.....	
Millers Falls Co., \$18.00.....	20¢
Chemey Anvil and Vise.....	25¢
Allen Anvil and Vise.....	35.00

Apple Parers.....	
Advance.....	40¢
Antim Combination.....	50¢
Baldwin.....	50¢
Champion.....	7.25
Eureka, 1888.....	17.00
Family Bay State.....	12.00
Gem.....	5.25
Gold Medal.....	4.00
Hudson's New '88.....	3.75
Ideal.....	3.00
Improved Bay State.....	30.00
Little Star.....	5.00
Monarch.....	13.50
New Lightning.....	5.50
Orion.....	4.00
Penn.....	4.00
Perfection.....	4.00
Pomona.....	4.00
Rocking Table.....	6.00
Turntable.....	4.50
Victor.....	13.50
Waverly.....	4.50
White Mountain.....	4.50
72.....	4.25
78.....	5.75

Augers and Bits.....	
Douglas Mfg. Co.....	70¢
Wm. A. Ives & Co.....	
Humphreysville Mfg. Co.....	
French, Swift & Co. (F. H. Beecher), Cook's, Douglas Mfg. Co.....	55¢
Cook's, N. H. Copper Co.....	50¢
Ives' Circular Lip.....	80¢
Patent Solid Head.....	30¢
C. E. Jennings & Co., No. 10, extension lip.....	40¢
C. E. Jennings & Co., No. 30.....	60¢
C. E. Jennings & Co., Auger Bits, 3/4 set.....	30¢
2 1/4 quarters, No. 5, 3/4; No. 30, 3/4.....	30¢
Lewis' Patent Single Twist.....	45¢
Jennings' Augers and Bits.....	55¢
Imitation Jennings' Bits.....	60¢
Pugh's Black.....	30¢
Car Bits.....	60¢
L. Hommedieu Car Bits.....	1.50
Forstner Pat. Aug Bits.....	10¢

Hollow Augers—

Ives'.....	25¢
French, Swift & Co.....	25¢
Douglas'.....	40¢
Bonney's Adjustable.....	40¢
Stearns'.....	20¢
Ives' Expansive, each \$4.50.....	50¢
Universal Expansive, each \$4.50.....	30¢
Wood's.....	25¢

Expansive Bits—

Clarks' small, \$18; large, \$25.....	35¢
Ives' No. 4, 1/2 dos \$80.....	40¢
Swan's.....	35¢
Stearns' No. 1, \$25; No. 2, \$22.....	20¢
Stearns' No. 2, \$45.....	20¢

Gimlet Bits—

Common.....	25¢
Diamond.....	25¢
Ree.....	25¢
Double Cut, Sheparison's.....	45¢
Double Cut, Ct. Valley Mfg. Co.....	30¢
Double Cut, Hartwell's.....	35¢
Double Cut, Douglas'.....	40¢
Double Cut, Ives'.....	60¢

Bit Stock Drills—

Morse Twist Drills.....	50¢
Standard.....	50¢
Cleveland.....	50¢
Syracuse, for wood (wood list).....	50¢
Syracuse, for metal.....	50¢
Williams or Holt's, for metal.....	50¢
Williams or Holt's, for wood.....	40¢

Ship Augers and Bits—

L'Hommiedieu's.....	15¢
Watrous'.....	15¢
Snell's.....	15¢
Snell's Ship Auger Pat'n Car Bits.....	15¢

'Awl Hafts—

Sewing, Brass Fer.....	35¢
Pat. Sewing, Short.....	40¢
Pat. Sewing, Long.....	40¢
Pat. Peg, Plain Top.....	10¢
Pat. Peg, Leather Top.....	12¢

Awls, Brad Sets, &c—

Awls, Sewing, Common.....	17¢
Awls, Should. Peg.....	25¢
Awls, Pat. Peg.....	35¢
Awls, Shouldered Brad.....	12¢
Awls, Handled Brad.....	12¢
Awls, Handled Scratch.....	12¢
Awls, Socket Scratch.....	12¢

Awl and Tool Sets—

Aiken's Sets, Awls and Tools.....	55¢
No. 20, 1/2 dos \$10.00.....	55¢
Frays Ad. Tool Hds., No. 1, 1/2.....	1.10
S. 1/2; 4, 8.....	25¢
Miller's Falls Ad. Tool Hds.....	25¢
No. 1, 1/2; 2, 1/2.....	25¢
Henry's Combination Haft.....	25¢
Brad Sets.....	
No. 42, \$10.50; No. 43, \$12.50.....	70¢
Stanley's Excelsior.....	30¢
No. 1, \$7.50; No. 2, \$4.00; No. 3, \$5.50.....	30¢

Axes—

Makers' and Special Brands—

First quality.....	25¢
Others.....	25¢

Axle Grease—

Fraser's.....	40¢
Fraser's, in boxes.....	40¢
Dixon's Everlasting, in bxs.....	10¢
Dixon's Everlasting.....	10¢
Lower grades, special brands.....	10¢

Axles—

No. 1.....	40¢
No. 7 to 14.....	55¢
No. 15 to 18.....	47¢
No. 19 to 22.....	70¢
National Tubular Self-Oiling; Standard Farm (1 to 5) and Special Farm (1 to 45).....	33¢
Less than 10 sets.....	33¢
Over 10 sets.....	33¢

Bag Holders—

Sprengle's Pat.....	18¢
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Balances—

Spring Balances.....	50¢
Common 24".....	50¢
Chatillon's Spring Balances.....	50¢
Chatillon's Circular Spring Balances.....	60¢

Bells—

Hand—

Light Brass.....	70¢
Extra Heavy.....	60¢
White Metal.....	60¢
Silver Chime.....	35¢
Globe (Cone's Patent).....	25¢

Door—

Gong, Abbe's.....	33¢
Gong, Yankee.....	45¢
Gong, Barton's.....	40¢
Crank, Taylor's.....	25¢
Crank, Brooks'.....	50¢
Crank, Cone's.....	10¢

Crank, Connel's.....	20¢
Lever, Sargent's.....	60¢
Lever, Taylor's Bronzed or Plated.....	25¢
Lever, Taylor's Japanned.....	50¢
Lever, R. E. M. Co.'s.....	50¢
Pull Brook's.....	50¢
Pull, Western.....	25¢

Cow—

Common Wrought.....	70¢
Western, Sargent's list.....	70¢
Kentucky, "Star".....	70¢
Kentucky, Sargent's list.....	70¢
Dodge, Genuine Kentucky.....	70¢
Texas Star.....	50¢
Call.....	40¢
Farm Bells.....	40¢
Steel Alloy Church and School Bells.....	40¢

Bellows—

Blacksmiths'.....	50¢
Molders'.....	40¢
Hand Bellows.....	40¢

Belting, Rubber—

Common Standard.....	70¢
Standard.....	70¢
Extra.....	60¢
N. Y. B. & P. Co., Carbolite.....	60¢
N. Y. B. & P. Co., Diamond.....	50¢

Bench Stops—

Morrill's.....	50¢
Hochkiss's.....	50¢
Weston's, No. 1, \$10; No. 2, \$9.....	10¢
McGill's.....	10¢

Bits—

Auger, Gimlet, Bit Stock, Drills, &c., see Augers and Bits.....	
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Bit Holders—

Extension.....	40¢
Barber's.....	40¢
Ives.....	40¢
Diagonal.....	40¢
Angular.....	40¢

Blind Adjusters—

Domestic.....	30¢
Excelsior.....	30¢
Washburn's Self-Locking.....	30¢

Blind Fasteners—

Mackrell's.....	20¢
Van Sand's Screw Pat.....	15¢
Van Sand's Old Pat.....	15¢
Washburn's Old Pattern.....	15¢
Merriman's.....	15¢
Austin & Eddy No. 2008.....	15¢
Security Gravity.....	15¢

Blind Staples—

Barbed, 1/4 in. and larger.....	75¢
Barbed, 1/8 in.....	85¢

Blocks—

Cleveland Block Co., Mal. Iron.....	50¢
Moore's Novelty, Mal. Iron.....	50¢

Belts—

Door and Shutter—

Cast Iron Barrel, Square, &c.....	70¢
Cast Iron Shutter Bolts.....	70¢
Cast Iron Chain (Sargent's list).....	65¢
Ives' Patent Door Bolts.....	60¢
Wrought Barrel.....	70¢
Wrought Square.....	70¢
Wrt Shutter, all Iron, Stanley's.....	60¢
Wrt Shutter, Brass Knob.....	40¢
Wrt Shutter, Sargent's list.....	60¢
Wrt Sunk Flush, Sargent's list.....	55¢
Wrt Sunk Flush, Stanley's list.....	50¢
Wrt B.K. Flush, Com'n.....	55¢

Carriage, Machine, &c.—

Com. list June 10, '84.....	75¢
Genuine Eagle, list Oct. '84.....	75¢
Phila. pattern, list Oct. '84.....	75¢
R.B. & W., old list.....	70¢
Machine, according to size.....	75¢
Bolt Ends, according to size.....	75¢

Tire—

Common, list Feb. 23, '83.....	70¢
Portchester Bolt and Nut Company.....	70¢
Empire, list Feb. 23, '83.....	70¢
Keystone, Philadel., list Oct. '84.....	60¢
Norway, Phila., list Oct. '84.....	75¢
American Screw Company.....	75¢
Norway, Phil., list Oct. 15, '84.....	80¢
Eagle, Phil., list Oct. 15, '84.....	80¢
Phila., list Oct. 15, '84.....	80¢
R.B. & W., Philadel., list Oct. 15, '84.....	80¢
R.B. & W. Mfg. Co.....	70¢

Stove and Plow—

Stove.....	65¢
Plow.....	60¢
R. B. & W., Plow.....	55¢

Berax.....

Boring Machines—

Without Augers.....	
Douglas.....	50¢
Snell's, Rice's Pat.....	50¢
Jennings.....	50¢
Other Machines.....	25¢
Phillips' Patent.....	75¢
With Augers.....	75¢

Bow Pins—	
Humason, Beckley & Co.'s.....	60¢
Sargent & Co.'s.....	17¢
Peck, Stow & W. Co.....	60¢

Braces—

Barber's.....	50¢
No. 10 to 16.....	50¢
No. 20 to 32.....	50¢
No. 40 to 63.....	50¢

Barkers—

No. 8, 10 and 12.....	75¢
No. 8, 10 and 12.....	75¢
Osgood's Ratchet.....	50¢
Spofford's.....	50¢
Ives' New Haven Novelty.....	70¢
New Haven Ratchet.....	60¢
Barber Ratchet.....	60¢
Barbers.....	60¢
Spofford.....	60¢
Common Ball, American.....	1.10
Bartholomew's.....	1.10
No. 25, 27 and 30.....	50¢
No. 117, 118, 119.....	70¢

Amidon's.....

Barker's Imp'd Plain.....	75¢
Barker's Imp. Nickeled.....	75¢
Ratchet.....	75¢
Eclipse Ratchet.....	60¢
Globe Jawed.....	40¢
Corner Brace.....	40¢
Universal, 8 in., \$2.10; 10 in.....	2.25
Buffalo Ball.....	1.10
P. S. & W.....	10¢

Brackets—

Cards—

Horse & Curry.....10&10&10&10&10
 Cotton.....New list, Aug., 1888,
 10&10&10
 Wool.....New list, Aug., 1888,
 10&10&10

Carpet Stretchers—

Cast Steel, Polished.....\$ doz \$2.25
 Cast Iron, Steel Points.....\$ doz \$0.90
 Socket.....\$ doz \$1.75
 Bullard's.....25&25&10

Carpet Sweepers—

Russell No. 5.....\$ doz \$17.00
 Russell No. 7 New Drop Pan.....\$ doz \$19.00
 Russell, Grand.....\$ doz \$35.00
 Grand Rapids.....\$ doz \$22.00
 Crown Jewel, No. 1.....\$18.00; No. 2,
 \$19.00; No. 3, \$20.00
 Magic.....\$ doz \$15.00
 Jewel.....\$ doz \$17.00
 Improved Parlor Queen, Nickel-plated
 \$ doz \$27.00
 Improved Parlor Queen, Japaned
 \$ doz \$24.00
 Excelsior.....\$ doz \$22.00
 Garland.....\$ doz \$18.00
 Parlor Queen.....\$ doz \$24.00
 Housewife's Delight.....\$ doz \$15.00
 Queen, with band.....\$ doz \$18.00
 Ring.....\$ doz \$30.00
 Weed, Improved.....\$ doz \$18.00
 Hub.....\$ doz \$16.00
 Cog-Wheel.....\$ doz \$16.00
 Conqueror.....\$ doz \$22.00
 Easy.....\$ doz \$22.00
 Monarch.....\$ doz \$22.00
 Goshen.....\$ doz \$21.00
 Advance.....\$ doz \$18.00
 Ladies' Friend, No. 1, \$ doz, \$15.00;
 No. 2, \$ doz, \$16.00
 American.....\$ doz \$15.00
 Grand Republic.....\$ doz \$35.00

Cartridges—

See Ammunition.

Casters—

Bed.....New list:
 Plate.....Brass.....55&55&55
 Shallow Socket.....Others.....60&60&55
 Deep Socket.....40&10
 Yale Casters, list May, 1884.....30&10&40
 Yale, Gem.....60&60&55
 Martin's Patent (Phoenix).....45&10&50
 Payson's Anti-Friction.....50&60&10
 Giant Truck Casters.....30
 Stationary Truck Casters.....50&10
 Socket Truck Casters.....50

Cattle Leaders—

Humason, Beckley & Co.'s.....70
 Sargent's.....60&10
 Hotchkiss.....30
 Peck, Stow & W. Co.....50&10

Chain—

Trace, 6-10-2, exact,
 \$ pair, \$1.08.....50&10&50&10&55
 Trace, 6-10-3, exact,
 \$ pair \$2.....50&10&50&10&55
 Trace, 7-10-2, exact,
 \$ pair \$1.11.....50&10&50&10&55
 NOTE.—Traces "Regular" sizes, 3¢ net
 \$ pair less than exact
 Log, Fifth, Stretcher, and other fancy
 Chains, list Nov. 1, 1884.....50&10&50&10&55

American Coll, in cask lots,
 3-16 1/4 5-16 3/4 7-16 1/2 5 1/2 3/4
 \$8.75 6.25 5.00 4.50 4.40 4.00 3.75 3.50
 Less than cask lots, add 1/4¢ per lb.
 German Coll, list of June 20, 1887.....50&10&50&10&55

German Halter Chain, list of June 20,
 1887.....50&10&50&10&55
 Covert Halter, Hitching and Breast
 50&23
 Covert Traces.....30&23
 Onedda Halter Chain.....60&60&55
 Galvanized Pump Chain.....\$ doz \$0.90
 Jack Chain, Iron.....75&75&55
 Jack Chain, Brass.....70&70&55

Chalk—

White.....\$ gr 50¢
 Red.....\$ gr 70¢
 Blue.....\$ gr 85¢
 White Crayons, \$ gr 12¢@12 1/2¢.....10

Chalk Lines—

See Lines.

Chisels—

Socket Framing and Firmer.
 P. S. & W.....75&5&75&10
 New Haven.....75&5&75&10
 Witherby.....75&5&75&10
 Mix.....75&5&75&10
 Ohio Tool Co.....75&5&75&10
 Douglass.....75&5&75&10
 Buck Bros.....75&5&75&10
 Merrill.....75&5&75&10
 L. & J. J. White.....75&5&75&10
 Tanged and Miscellaneous.....40&10
 Butcher's.....\$4.75&5.00
 Spear & Jackson's.....\$ doz \$0.85 to 2
 Buck Bros.....30¢
 Cold Chisels, \$ doz.....16&19

Chucks—

Beach Pat.....each \$8.00.....20¢
 Morse's Adjustable, each, \$7.00, 20¢@20&55
 Danbury.....each \$6.00, dia 30¢@30&55
 Syracuse, Bais Pat.....25¢

Clamps—

Providence Tool Co.'s Wrought Iron.....25¢
 Adjustable, Gray's.....20¢
 Adjustable, Lumber's.....20¢
 Adjustable, Snow's.....40&55
 Adjustable, Hammers.....20&10
 Adjustable, Stearn's.....20&10
 Stearn's Adjustable Cabinet and Corner.....20&10
 Cabinet, Sargent's.....60&10
 Carriage Makers' Sargent's.....70&10
 Eberhard Mfg. Co.....40&55&10&10
 Warner's.....40&10&40&10&55
 Saw Clamps, see Vises

Clips—

Norway Axle, 1/4 & 5-16.....55&55&55
 2nd grade Norway Axle, 1/4 & 5-16.....55&55
 Superior Axle Clips.....60¢&60¢@60¢&55

Norway Spring Bar Clips, 5-16.....60&55&55
 Wrought-Iron Felloe Clips.....\$ doz \$1.50
 Steel Felloe Clips.....\$ doz \$1.50
 Baker Axle Clips.....25¢

Cockeyes—

50¢

Cooks, Brass—

Hardware list.....40. & 10&25

Coffee Mills—

Box and Side, list revised Jan. 1, 1888,
 50&25
 American, Enterprise Mfg. Co. 20&10&30
 The "Swift," Lane Bros.....20&10

Compasses, Dividers, &c—

Compasses, Callipers, Dividers.....70&70&10
 Bemis & Call Co.'s Dividers.....60&55
 Bemis & Call Co.'s Compasses & Call-
 pers.....50&55
 Bemis & Call Co.'s Wing & Inside or
 Outside.....50&55
 Bemis & Call Co.'s Double.....60
 Bemis & Call Co.'s (Call's Pat. Inside).....30
 Excelsior.....50
 J. Stevens & Co.'s Callipers and Dividers.....25&10
 Starrett's Spring Callipers and Dividers.....25&10
 Starrett's Lock Callipers and Dividers.....25&10
 Starrett's Combination Dividers.....25&10

Coopers' Tools—

Bradley's.....80¢
 Bartlett's.....30&30&55
 L. & J. J. White.....50&55
 Albertson Mfg. Co.....25¢
 Beatty's.....40&40&55
 Sandusky Tool Co.....30&30&55

Corkscrews—

Humason & Beckley Mfg. Co. 40&40&10
 Clough's Pat.....35¢@33¢&55
 Howe Bros & Hulbert.....35¢

Cork Knives and Cutters—

Bradley's.....10¢
 Wadsworth's.....25¢

Cradles—

Grain.....50&25

Crow Bars—

Cast Steel.....\$ doz \$4
 Iron, Steel Points.....\$ doz \$3 1/2

Curry Combs—

Fitch's.....50&10&50&10&10
 Rubberper dos \$10.00.....20¢
 Perfect.....50¢

Curtain Pins—

Silvered Glass.....net
 White Enamel.....net

Cutlery—

Beaver Falls & Booth's.....33¢
 Wostenholme.....\$7.75 to 2

Dampers, &c—

Dampers, Buffalo.....50¢
 Buffalo Damper Clips.....50¢
 Crown Damper.....40¢
 Excelsior.....40&10

Dividers—

See Compasses.

Dog Collars—

Embossed, Gilt, Pope & Steven's list.....30&10
 Leather, Pope & Steven's list.....40¢
 Brass, Pope & Steven's list.....40¢

Door Springs—

Torrey's Rod, regular size.....\$ doz \$1.30
 Gray's, \$ gr, \$20.00.....20¢
 Bee Rod \$ gr, \$20.00.....20¢
 Warner's No. 1, \$ doz, \$2.50; No. 2,
 \$3.30.....40&10&50
 Gem (Coll), list April 19, 1888.....10¢
 Star (Coll), list April 19, 1888.....30¢
 Victor (Coll).....60&60&10
 Champion (Coll).....60&10&60&10
 Philadelphia, 5 in., \$5.00; 8 in., \$7.75.....
 Cowell's.....No. 1, \$ doz, \$18.00; No. 2,
 \$15.00.....50¢
 Rubber, complete, \$ doz, \$4.50.....55&10
 Hercules.....10&55
 Shaw Door Check and Spring.....25¢@30¢&35

Drawing Knives—

Witherby.....75&5
 P. S. & W.....75&5
 Mix.....75&5
 New Haven.....60&10&60&10&55
 Merrill.....75&5&75&10
 Douglas.....15&10&25
 Watrous.....20&55
 L. & J. J. White.....20&55
 Bradley's.....35¢
 Adjustable Handle.....25¢@34¢
 Wilkinson's Folding.....25¢@25&55

Drills and Drill Stocks—

Blacksmiths'.....each \$1.75
 Blacksmiths' Self-Feeding, each \$7.50, 20¢
 Breast, P. S. & W.....40&10
 Breast, Wilson's.....30&55
 Breast, Millers Falls.....each \$3.00, dia 25¢
 Breast, Bartholomew's.....each \$2.50, dia
 25&10&40
 Ratchet, Merrill's.....20&20&55
 Ratchet, Ingersoll's.....25¢
 Ratchet, Parker's.....20&20&55
 Ratchet, Whitney's.....20&10
 Ratchet, Weston's.....20¢@25¢
 Ratchet, Moore's Triple Action.....25¢@30¢
 Whitney's Hand Drill, Plain, \$11.00;
 Adjustable, \$12.00.....20&10
 Wilson's Drill Stocks.....10¢
 Automatic Boring Tools.....\$1.75&1.85

Drill Bits—

Morse.....50&10&55
 Standard.....50&10&55
 Syracuse.....50&10&55
 Cleveland.....50&10&55
 Williams.....50&10&10

Drill Bits.—See Augers and Bits.

Drill Chucks.—See Chucks.**Dripping Pans—**

Small sizes.....\$ doz \$6 1/4
 Large sizes.....\$ doz \$6 1/4

Egg Beaters—

Dover.....\$ doz \$1.50
 National, \$ doz \$4.50.....35¢
 Family (T. & S. Mfg. Co.), \$ gro \$17.00;
 \$18.00
 Duplex (Standard Co.).....\$ gro \$15.00
 Rival (Standard Co.).....\$ gro \$12.00
 Large Duplex (Standard Co.), \$ doz \$4.50
 Triumph (T. & S. Mfg. Co.), \$ gro \$10.50
 @ \$11.50

Advance, No. 1.....\$ gro \$10.50
 Advance, No. 2.....\$ gro \$10.00
 Bryant's.....\$ gro \$15.00
 Ayres' Spiral.....\$ gro \$5.00
 Soule (H. & R. Mfg. Co.).....\$ gro \$12.50
 Easy (H. & R. Mfg. Co.).....\$ gro \$14.00
 Triple (H. & R. Mfg. Co.).....\$ gro \$12.50
 Spiral (H. & R. Mfg. Co.).....\$ gro \$4.50
 Faine, Diehl & Co.'s.....\$ gro \$24.00

Egg Poachers—

Buffalo Steam Egg Poachers, \$ doz, No. 1,
 \$5.00; No. 2, \$9.00.....25¢

Electric Bell Sets—

Wollensak's.....20¢
 Bigelow & Dowse.....20¢

Emery—No. 4 to No. 54 to Flour, CF

Keys, \$ doz.....45 gr. 150 gr. F FF.
 1/4 Keys, \$ doz.....5 1/4 5 1/4 5 1/4
 1/2 Keys, \$ doz.....5 1/4 5 1/4 5 1/4
 10-b cans, 10.....6 1/4 5 1/4 5 1/4
 In case.....6 1/4 5 1/4 5 1/4
 10-b cans, less than 10.....10 1/4 10 1/4 7 1/4

Enameled and Tinned Ware—

See Hollow Ware.

Escutcheon Pins—

Iron, list Nov. 11, 1888.....50&10&50&10&55
 Brass.....60&60&55

Escutcheons.

Door Lock.....Same dis as Door Locks.
 Brass Thread.....60¢@60&10
 Wood.....25¢

Faucets—

Fenn's.....40¢
 Bohren's Pat. Rubber Ball.....25¢
 Fenn's Cork Stops.....33¢
 Fenn's Pat. Petroleum.....60¢
 B. & L. B. Co.....40&55
 West's Lock, Open and Shut Key.....50¢
 Star, Metal Plug, new list.....40¢
 Lockport, Metal Plug, reduced list.....60¢
 Metallic Key, Leather Lined.....60&10
 Cork Lined.....60&10&10
 Burnside's Red Cedar.....70&5&70&10
 Burnside's Red Cedar, bbl lots.....50&10
 John Sommers'.....40¢
 Peerless Best Block Tin Key.....40¢
 IXL, 1st quality, Cork Lined.....50¢
 Diamond Lock.....40¢
 Perfection, Fla. Red Cedar.....50¢
 Goodenough Cedar.....50¢
 Boss Metallic Key.....50¢
 Reliable Cork Lined.....60¢
 Western Pattern Cork Lined.....50¢
 Self-Measuring.....20&10
 Enterprise, \$ doz \$50.00.....20&10
 Lane's, \$ doz \$30.00.....25&10
 Victor, \$ doz \$36.00.....25&10

Felloe Plates—

\$ doz \$6 1/4

Fifth Wheels—

Derby and Cincinnati.....45&55

Files—

Domestic.....
 Nicholson Files, Rasps, &c.....60&10&60&55
 Nicholson's X. F. Files.....25¢
 Nicholson's R. F. Files (Seconds).....75¢
 75¢ (extra prices on certain sizes)
 Other makers, best brands.....60&10&60&10&10
 Fair brands.....60&10&10&70
 Second quality.....70&10&75&10
 Nicholson's Horse Rasps.....60&10&60&55
 Heller's Horse Rasps.....50&75&60&10
 McCaffrey's Horse Rasps.....50&10

Fluting Machines—

Knox, 4 1/2-inch Rolls.....\$3.25 each } 35¢
 Knox, 6-inch Rolls.....\$3.80 each } 35¢
 Eagle, 3 1/2-inch Roll, \$2.15.....35¢
 Eagle, 5 1/2-inch Roll, \$2.55.....35¢
 Crown, 4 1/2 in., \$3.50; 6 in., \$4.00; 8 in.,
 \$5.50 each.....35¢
 Crown Jewel, 6 in.....\$3.50 each, 35¢
 American, 5 in., \$3.00; 6 in., \$3.40; 7 in.,
 \$4.50 each.....35¢
 Domestic Fluter.....\$1.50 each net
 Geneva Hand Fluter, White Metal,
 \$ doz \$12 dia 25¢
 Crown Hand Fluter, Nos. 1, \$10.00; 2,
 \$12.50; 3, \$10.00.....30¢
 Shepard Hand Fluter, No. 85 \$ doz
 \$15.30.....40¢
 Shepard Hand Fluter, No. 110 \$ doz
 \$11.00.....40¢
 Shepard Hand Fluter, No. 96 \$ doz
 \$8.00.....40¢
 Clark's Hand Fluter, \$ doz \$15.00.....35¢
 Combined Fluter and Sad Iron,
 \$ doz \$15.00.....30¢
 Buffalo.....\$ doz \$15.00.....10¢

Fluting Scissors—

45¢

Fodder Squeezers—

Blair's.....\$ doz \$2.00
 Blair's "Climax".....\$ doz \$1.25

Forks—

Hay, Manure, &c., Asso. List.....65¢
 Hay, Manure, &c., Phila. List.....60¢@60&55
 Plated, see Spoons.

Freezers, Ice Cream—

Buffalo Champion.....60&10&55
 Shepard's Lightning.....55¢
 White Mountain.....60¢

Fruit and Jelly Presses—

Enterprise Mfg. Co.....20&10&30
 Henis.....\$ doz \$3.75&4.00
 F. D. & Co.....\$ doz \$3.75&4.00
 Shepard's Queen City.....40¢

Fry Pans—

High List.....75&5&75&10

No.....0 1 2 3 4
 \$ doz.....\$3.75 \$4.70 \$5.30 \$5.95 \$6.55

No.....5 6 7 8
 \$ doz.....\$7.50 \$8.75 \$10.00 \$11.25

Low List.....65&10

No.....0 1 2 3 4
 \$ doz.....\$3.00 \$3.75 \$4.25 \$4.75 \$5.25

No.....5 6 7 8
 \$ doz.....\$6.00 \$7.00 \$8.00 \$9.00

Fuse—

\$ 1000 ft.

Common Hemp Fuse, for dry ground, \$2.70

Common Cotton Fuse, for dry ground, 2.85

Single Taped Fuse, for wet ground, 4.75

Double Taped Fuse, for very wet gr., 6.00

Triple Taped Fuse, for very wet gr., 7.25

Small Gutta Percha Fuse, for water, 7.50

Large Gutta Percha Fuse, for water, 12.00

Gauges—

Marking, Mortise, &c.....60&10

Starrett's Surface, Center and Scratch
 25&10

Wire, low list.....10&10

Wire, Wheeler, Madden & Co.....10¢

Wire, Morse's.....50&50&55

Wire, Brown & Sharpe's.....10¢@30¢

Gimlets—

Nail and Spike.....50&10&55

"Eureka" Gimlets.....40&10

"Diamond" Gimlets.....\$ gr \$5.00

Double Cut, Shephardson's.....45¢@45&55

Double Cut, Ives.....60¢@60&55

Double Cut, Douglass.....40&10

"Bee," \$ gr \$12.....25¢@25&55

Glue—

Le Page's Liquid.....25¢@25&55

Upton's Liquid.....55¢

Le Page & Co.'s Improved Process.....25¢@25&55

Glue Pots—

Tinned.....40¢

Enameled.....40&55

Family, Howe's "Eureka".....40¢

Family, L. F. C.'s "Handy".....50¢

Grindstones—

Small, at factory.....\$ ton \$7.50@9.00

Grindstone Fixtures—

Sargent's Patent.....70&10

Reading Hardware Co.....10&10

Hack Saws.—

See Saws.

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Melasses Gates—	
Stebbin's Pat.	70¢@70¢1/4
Stebbin's Genuine.	60¢@10¢10
Stebbin's Tinned Ends.	40¢10
Chase's Hard Metal.	50¢10
Bush's.	20¢
Lincoln's Pattern.	70¢@70¢10
Wood's.	30¢10
Boss, # dos:	
No. 1, 7; No. 2, 8; No. 3, 8; No. 4, 10.	60¢10¢10
Money Drawers.	
Money Drawers.	7¢ dos, \$18¢@30
Muzzles—	
Safety.	7¢ dos, \$3.00, 25¢
Nails, see Trade Report.	
Wire Nails & Brads, list July 14, '87	
Wire Nails, Standard Penny.	70¢10
Wire Nails, Standard Penny.	25¢50¢@25.60
Nail Puller—	
Curries Hammer.	7¢ dos, \$2, net
Giant, No. 1.	7¢ dos, \$30.00, 10¢
Pellcan.	7¢ dos, \$2.00, 25¢
Boss.	7¢ dos, \$30.00, 30¢
Lighting.	7¢ dos \$21.00
Nail Sets—	
Square.	7¢ gr., \$4.00¢@4.25
Round.	7¢ gr., \$3.25
Cannon's Diamond Point.	7¢ gr., \$12, 20¢
Nut Crackers—	
Table (H. & B. Mfg. Co.).	40¢
Blake's Pattern.	7¢ dos \$2.00, 10¢
Turner & Seymour Mfg. Co.	50¢
Nuts—	
Nuts, off list Jan. 1, 1888: Square. Hex.	
Hot Pressed.	5.4¢ 5.9¢
Cold Punched.	5.4¢ 5.5¢
In lots less than 100 lb., 7¢, add 1/4¢; 1-lb boxes, add 1¢ to list.	
Oakum—	
Government.	7¢ 7 1/2¢ @ 8¢
U. S. Navy.	7¢ 6 1/2¢ @ 7¢
Navy.	7¢ 5 1/2¢ @ 6 1/2¢
Oilers—	
Zinc and Tin.	65¢@65¢10
Brass and Copper.	50¢10¢@50¢10¢5
Malleable, Hammer's Improved, No. 1.	\$3.00; No. 2, \$4.00; No. 3, \$4.40
10¢10¢10	
Malleable, Hammer's, Old Pattern, same list.	40¢
Prior's Pat. or "Paragon" Zinc.	60¢10¢10
Prior's Pat. or "Paragon" Brass.	50¢
Olmstead's Tin and Zinc.	50¢
Olmstead's Brass and Copper.	50¢
Broughton's Zinc.	50¢
Broughton's Brass.	50¢
Packing, Steam—	
Rubber—	
Standard.	60¢10¢@60¢10¢10
K. V. B. & P. Co. Standard.	50¢10¢@60
N. Y. B. & P. Co., Empire.	70¢
N. Y. B. & P. Co., Salamander.	7¢ 65¢, 30¢
Jenkins' Standard.	7¢ 80¢, 35¢
Miscellaneous—	
American Packing.	10¢@11¢ 7¢
Russia Packing.	14¢ 7¢
Italian Packing.	13¢@14¢ 7¢
Ottoman Packing.	15¢@17¢ 7¢
Jute.	7¢@8¢ 7¢
Padlocks—	
See Locks.	
Pails—	
Galvanized Iron—	
Quarts.	10 12 14
Hill's Light Weight.	7¢ dos, \$2.75 3.00 3.25
Hill's Heavy Weight.	7¢ ds. 3.00 3.25 3.75
Whitings.	2.75 3.00 3.25
Sidney Shephard & Co.	2.80 3.00 3.40
Iron Clad.	2.75 3.00 3.25
Fire Buckets.	2.75 3.25 3.50
Buckets, see Well Buckets.	
Indurated Fibre Ware—	
Star Pails, 12 qt.	7¢ dos \$4.50
Fire, Stable and Milk, 14 qt.	7¢ dos \$5.25
Pencils—	
Faber's Carpenters'.	high list 50¢
Faber's Round Gilt.	7¢ gro \$5.25
Dixon's Lead.	7¢ gro \$4.50
Dixon's Lumber.	7¢ gro \$5.75
Dixon's Carpenters'.	40¢10
Picks—	
Railroad or Adse Eye, 5 to 6, \$12.00; 6 to 7, \$13.00.	60¢5¢@60¢10
Picture Nails—	
Brass Head, Sargent's list.	50¢10¢10
Brass Head, Combination list.	50¢10
Porcelain Head, Sargent's list.	50¢10¢10
Porcelain Head, Combination list.	40¢10
Niles' Patent.	40¢
Pinking Irons—	
Pinking Irons.	7¢ dos 65¢ net
Pipe, Wrought Iron—	
List March 23, 1887.	
14 and under, Plain.	55¢
14 and under, Galvanized.	50¢
14 and over, Plain.	55¢2 1/2¢
14 and over, Galvanized.	55¢2 1/2¢
Boller Tubes, Iron.	60¢2 1/2¢
Planes and Plane Irons—	
Wood Planes—	
Molding.	50¢5¢@50¢10
Bench, First Quality.	60¢50¢5
Bench, Second Quality.	60¢10¢@60¢10¢10
Balley's (Stanley R. & L. Co.).	40¢10
Iron Planes—	
Balley's (Stanley R. & L. Co.).	40¢10
Miscellaneous Planes (Stanley R. & L. Co.).	20¢10
Victor Planes (Stanley R. & L. Co.).	30¢10
Steer's Iron Planes.	35¢35¢5
Meriden Mail Iron Co.'s.	30¢10¢@30¢10¢10
Davis's Iron Planes.	30¢10¢@30¢10¢10
Birmingham Plane Co.	50¢50¢5
Gage Tool Co.'s Self-Setting.	20¢10
Chaplin's Iron Planes.	40¢10¢5
Sargent's.	30¢10¢@30¢10¢10

Plane Irons—	
Plane Irons.	20¢10
Plane Irons, Butcher's.	\$5.00¢@5.25 to 2
Plane Irons, Buck Bros.	30¢
Plane Irons, Auburn Tool Co., "This- tle"	40¢
Sandusky Tool Co.—	
Single and Cut.	30¢
Double.	40¢
L. & I. J. White.	25¢
Pliers and Nippers—	
Button's Patent.	30¢10¢40
Hall's No. 2, 5 in., \$18.50; No. 4, 7 in.	\$21.00 7¢ dos
Humason & Beckley Mfg. Co.	50¢50¢10
Gas Pliers.	80¢
Gas Pliers, Custard's Nickel Plated.	60¢5
Eureka Pliers and Nippers.	25¢
Russell's Parallel.	25¢
P. S. & W. Cast Steel.	50¢
P. S. & W. Tinnars' Cutting Nippers.	add 6¢ dis 10¢
Carew's Pat. Wire Cutters.	20¢
Morrill's Parallel.	7¢ dos, \$12.00, 30¢5
Cronk's 8 in., \$15.00; 10 in., \$21.00.	40¢40¢5
Plumbs and Levels—	
Regular List.	70¢10¢70¢10¢10
Diston's.	45¢10
Pocket Levels.	70¢10¢70¢10¢5
Davis Iron Levels.	30¢
Davis' Inclinoimeters.	10¢10
Polish, Metal.	
Prestoline.	20¢10
Kretzline Paste.	3¢
Gaston's Silver Compound.	3¢5
Pokes, Animal—	
Bishop's I. X. L.	7¢ dos \$5.50
Bishop's O. K.	7¢ dos \$5.50
Bishop's Pioneer.	7¢ dos \$3.75
Bishop's American.	7¢ dos \$3.00
Peppers, Corn—	
Round or Square, 1 qt.	7¢ gr \$12.00¢@15.00
Round or Square, 2 qt.	7¢ gr \$25.00¢@28.00
Post Hole and Tree Augers and Diggers—	
Samson Post Hole Digger.	7¢ dos \$36.00, 25¢10
Fletcher Post Hole Augers.	7¢ dos \$36, 20¢
Eureka Diggers.	7¢ dos \$18.00¢@17.00
Lead's.	7¢ dos \$8.00¢@9.00
Vaughan's Post Hole Auger.	7¢ dos \$13.00¢@14.00
Kohler's Little Giant.	7¢ dos \$18.00
Kohler's Hercules.	7¢ dos \$15.00
Kohler's New Champion.	7¢ dos \$9.00
Schneider.	7¢ dos \$18.00
Ryan's Post Hole Diggers.	7¢ dos \$24.00
Cronk's Post Bars.	7¢ dos \$60.00
Gibb's Post Hole Digger.	7¢ dos \$30.00, 40¢10¢10
Potato Parers—	
White Mountain.	7¢ dos \$5.00¢@5.50
Antrim Combination.	7¢ dos \$8.00
Hoosier.	7¢ dos \$13.50
Pruning Hooks and Shears—	
Diston's Combined Pruning Hook and Saw.	7¢ dos \$18.00, 20¢10
Diston's Pruning Hook.	7¢ dos \$12.00
E. S. Lee & Co.'s Pruning Tools.	40¢
Pruning Shears, Henry's Pat.	7¢ dos \$7.50¢@8.00 net
Henry's Pruning Shears.	7¢ dos \$4.25¢@4.50 net
Wheeler, M. & C. Co.'s Combination.	7¢ dos \$12.00, 20¢
Dunlap's Saw and Chisel.	7¢ dos \$8.50, 80¢
J. Mallinson & Co., No. 1, \$5.25; No. 2, 7.25	
Pulleys—	
Hot House, Awning, &c.	60¢10
Japanned Screw.	60¢10
Brass Screw.	60¢10
Japanned Side.	60¢10
Japanned Clothes Line.	60¢10
Empire Sash Puller.	60¢80
Moore's Sash, Anti-Friction.	50¢
Hay Fork, Solid Eye, \$1.00. Swivel.	\$1.50
Hay Fork, "Anti-Friction," 5 in. Solid.	\$5.70
Hay Fork, "F" Common and Pat.	20¢
Hay Fork, Tarbo's Pat. Iron.	20¢
Hay Fork, Reed's Self-Lubricating.	45¢
Shade Rack.	45¢
Tackle Blocks.	See Blocks
Moore's Anti-Friction 5 in. Wheel.	7¢ dos \$12.00, 40¢
Pumps—	
Cistern, Best Makers.	50¢10¢@60
Pitcher Spout, Best Makers.	60¢10
Pitcher Spout, Cheaper Goods.	70¢10¢5
Punches—	
Saddlers' or Drive, good.	7¢ dos, 60¢65¢
Bemis & Call Co.'s Springfield Socket.	50¢5
Spring, good quality.	7¢ dos \$2.50¢@2.60
Spring, Leach's Pat.	15¢
Bemis & Call Co.'s Spring and Check.	40¢
Solid Tinnars'.	7¢ dos \$1.44, 55¢
Tinnars' Hollow Punches.	20¢2
Rice Hand Punches.	15¢
Avery's Revolving.	30¢10
Avery's Saw-Set and Punch. See Saw Sets.	
Rail—	
Sliding Door, Wrt Brass, 35¢.	15¢
Sliding Door, Bronzed Wrt Iron, 7 ft. 7 in.	\$12.00
Sliding Door, Iron, Painted, 7 foot 4 in., 40¢	
Barn Door, Light, In.	1/4 1/2 3/4
Per 100 feet.	\$2.00 2.50 3.10, 10¢
B. D. for N. E. Hangers.	
Small, Med. Large.	\$2.15 2.70 3.25, net
Terry's Wrought Iron, 7 foot.	40¢2
Victor Track Rail, 7 foot.	40¢2
Carrier Steel Rail, 7 foot.	40¢2
Moore's Wrought Iron.	25¢
Rakes—	
Cast Steel, Association goods.	65¢
Cast Steel, outside goods.	60¢10¢70
Gilbeable.	70¢70¢5
Gibbs Lawn Rake.	\$12.00
Canton Lawn Rake.	\$9.00, 50¢
Fort Madison Prize Bow Brace and Peerless.	65¢
Fort Madison Steel Tooth Lawn Rake.	\$6.00.

Razors—	
J. R. Torrey Razor Co.	20¢
Wostenholme and Butcher, \$10.00 to 2	10¢
Razor Straps—	
Genuine Emerson	60¢@60¢5
Imitation	7¢ doz \$2.00, 20¢10¢5
Torrey's	20¢
Badger's Belt and Com	7¢ doz \$2.00
Lamont Combination	7¢ doz \$4.00
Rivets and Barre—	
Copper	50¢
Iron, list Nov. 17, '87	50¢
Rivet Sets	
Rivet Sets	50¢10¢
Reeds—	
Stair, Brass	25¢2
Stair, Black Walnut	7¢ doz 40¢
Rollers—	
Barn Door, Sargent's list	60¢10¢10¢
Acme Moore's Anti-Friction	55¢
Union Barn Door Roller	70¢
Rope—	
Manufacturers' prices for large lots:	
Manila, 1/4 in. and larger	7¢ 15¢
Manila, 1/2 in. and larger	7¢ 16¢
Manila, 3/4 in. and larger	7¢ 16¢
Manila, 1 in. and larger	7¢ 16¢
Manila, 1 1/4 in. and larger	7¢ 16¢
Manila, 1 1/2 in. and larger	7¢ 16¢
Manila, 1 3/4 in. and larger	7¢ 16¢
Manila, 2 in. and larger	7¢ 16¢
Manila, 2 1/4 in. and larger	7¢ 16¢
Manila, 2 1/2 in. and larger	7¢ 16¢
Manila, 2 3/4 in. and larger	7¢ 16¢
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Manila, 78 1/4 in. and larger	7¢ 16¢
Manila, 78 1/2 in. and larger	7¢ 16¢
Manila, 78 3/4 in. and larger	7¢ 16¢
Manila, 79 in. and larger	7¢ 16¢
Manila, 79 1/4 in. and larger	7¢ 16¢
Manila, 79 1/2 in. and larger	7¢ 16¢
Manila, 79 3/4 in. and larger	7¢ 16¢
Manila, 80 in. and larger	7¢ 16¢
Manila, 80 1/4 in. and larger	7¢ 16¢
Manila, 80 1/2 in. and larger	7¢ 16¢
Manila, 80 3/4 in. and larger	7¢ 16¢
Manila, 81 in. and larger	7¢ 16¢
Manila, 81 1/4 in. and larger	7¢ 16¢
Manila, 81 1/2 in. and larger	7¢ 16¢
Manila, 81 3/4 in. and larger	7¢ 16¢
Manila, 82 in. and larger	7¢ 16¢
Manila, 82 1/4 in. and larger	7¢ 16¢
Manila, 82 1/2 in. and larger	7¢ 16¢
Manila, 82 3/4 in. and larger	7¢ 16¢
Manila, 83 in. and larger	7¢ 16¢
Manila, 83 1/4 in. and larger	7¢ 16¢
Manila, 83 1/2 in. and larger	7¢ 16¢
Manila, 83 3/4 in. and larger	7¢ 16¢
Manila, 84 in. and larger	7¢ 16¢
Manila, 84 1/4 in. and larger	7¢ 16¢
Manila, 84 1/2 in. and larger	7¢ 16¢
Manila, 84 3/4 in. and larger	7¢ 16¢
Manila, 85 in. and larger	7¢ 16¢
Manila, 85 1/4 in. and larger	7¢ 16¢
Manila, 85 1/2 in. and larger	7¢ 16¢
Manila, 85 3/4 in. and larger	7¢ 16¢
Manila, 86 in. and larger	7¢ 16¢
Manila, 86 1/4 in. and larger	7¢ 16¢
Manila, 86 1/2 in. and larger	7¢ 16¢
Manila, 86 3/4 in. and larger	7¢ 16¢
Manila, 87 in. and larger	7¢ 16¢
Manila, 87 1/4 in. and larger	7¢ 16¢
Manila, 87 1/2 in. and larger	7¢ 16¢
Manila, 87 3/4 in. and larger	7¢ 16¢
Manila, 88 in. and larger	7¢ 16¢
Manila, 88 1/4 in. and larger	7¢ 16¢
Manila, 88 1/2 in. and larger	7¢ 16¢
Manila, 88 3/4 in. and larger	7¢ 16¢
Manila, 89 in. and larger	7¢ 16¢
Manila, 89 1/4 in. and larger	7¢ 16¢
Manila, 89 1/2 in. and larger	7¢ 16¢
Manila, 89 3/4 in. and larger	7¢ 16¢
Manila, 90 in. and larger	7¢ 16¢
Manila, 90 1	

Machine-	
Flat Head, Iron.....	55¢
Round Head, Iron.....	50¢
Bench and Hand-	
Bench, Iron.....	55¢10¢55¢10¢10¢
Bench, Wood, Beech.....	55¢10¢55¢10¢10¢
Bench, Wood, Hickory.....	55¢10¢55¢10¢10¢
Hand, Wood.....	55¢10¢55¢10¢10¢
Lag, Blunt Point.....	75¢10¢10¢
Coach and Lag, Gimlet Point.....	75¢
Bed.....	25¢55¢
Hand Rail, Sargent's.....	60¢10¢10¢
Hand Rail, H. & B. Mfg. Co.....	70¢10¢75¢
Hand Rail, Am. Screw Co.....	75¢
Jack Screws, Millers Falls list.....	50¢50¢55¢
Jack Screws, P. S. & W.....	35¢
Jack Screws, Sargent.....	60¢10¢50¢10¢55¢
Jack Screws, Stearns.....	40¢40¢10¢
Scroll Saws-	
Lester, complete, \$10.00.....	25¢
Rogers, complete, \$4.00.....	25¢
Barnes' Builders' and Cabinet Makers.....	35¢
Barnes' Scroll Saw Blades.....	35¢
Scythe Snaths.....	
50¢25¢	
Shears-	
American (Cast) Iron.....	75¢10¢75¢10¢55¢
Pruning.....	See Pruning Hooks and Shears
Barnard's Lamp Trimmers.....	50¢10¢37¢
Tinners.....	20¢25¢
Seymour's, List, Dec. 1881.....	60¢10¢10¢50¢10¢10¢55¢
Heinrich's, List, Dec. 1881.....	60¢10¢10¢50¢10¢10¢55¢
Heinrich's Tailor's Shears.....	33¢10¢
First quality C. S. Trimmers.....	80¢80¢10¢
Second quality C. S. Trimmers.....	80¢10¢80¢10¢10¢
Acme Cast Shears.....	10¢10¢
Diamond Cast Shears.....	10¢
Clippers.....	10¢
Victor Cast Shears.....	75¢10¢75¢10¢55¢
Howe Bros. & Hulbert, Solid Forged Steel.....	40¢
Chicago Drop Forge & F. Co., Solid Steel Forged.....	70¢
Clausen Shear Co., Japanned.....	70¢
Clausen Shear Co., Nickleled, same list.....	60¢
Sheaves-	
Sliding Door.....	50¢10¢50¢55¢
M. W. Co., list July, 1888.....	55¢20¢
R. & E. list Dec. 18, 1888.....	55¢20¢
Corbin's list.....	50¢10¢25¢
Patent Roller.....	50¢10¢25¢
Patent Roller, H. & B. Mfg. Co.....	75¢
Russell's Anti-Friction, list Dec. 18, 1888.....	60¢25¢
Moore's Anti-Friction.....	50¢
Sliding Shutter.....	60¢10¢25¢
R. & E. list Dec. 18, 1888.....	60¢10¢25¢
Sargent's list.....	60¢10¢
Reading list.....	60¢10¢10¢
Ship Tools-	
L. & J. White.....	20¢55¢
Albertson Mfg. Co.....	25¢
Shoes, Horse, Mule, &c.-	
Burden's, Perkins', Phoenix, at factory.....	\$4.00
Shut-	
Eastern prices 2¢ off, cash, 5 days.....	
Drop, 5 bag, 25 b.....	\$1.20
Drop, 5 bag, 5 b.....	.20
Buck and Chilled, 5 25-b bag.....	1.45
Buck and Chilled, 5 5-b bag.....	.34
Shovels and Spades-	
Ames' Shovels, Spades, &c., list Nov. 1, 1888.....	20¢
Norris-Jobbers frequently give @ 7¢ extra on above.....	
Griffith's Black Iron.....	50¢10¢
Griffith's C. S.....	60¢50¢10¢
Griffith's Solid C. S. R. E. Goods.....	20¢
Old Colony (Sanford Fork & Tool Co.).....	20¢
St. Louis Shovel Co.....	20¢50¢75¢
Hussey, Binns & Co.....	15¢25¢
Hubbard & Co.....	20¢20¢75¢
Lehigh Mfg. Co.....	50¢10¢
Payne Petroleum & Son, list January, 1888.....	30¢
Remington's (Lowman's Patent).....	30¢10¢40¢
Rowland's, Black Iron.....	50¢10¢
Rowland's Steel.....	60¢55¢50¢10¢
Shovels and Tongs-	
Iron Head.....	50¢10¢50¢10¢55¢
Brass Head.....	60¢10¢10¢
Skins, Thimble-	
Western list.....	75¢55¢75¢10¢
Columbus Wrt. Steel, list Nov. 1, 1887.....	20¢
Coldbrookdale Iron Co.....	50¢10¢
Utica P. S. T. Skins.....	60¢
Utica Turned and Fitted.....	35¢
Sieves-	
Buffalo Metallic, S. S. & Co.....	50¢25¢10¢
Barber Flour Sifters.....	50¢10¢
Smith's Adjustable Sifters.....	50¢10¢
Smith's Adjustable Milk Strainer.....	50¢10¢
Smith's Adjustable T. & C. Strainer.....	50¢10¢
Sieves, Wooden Rim-	
Mesh 18, Nested, 5 doz.....	Iron. Plated. 70¢ 90¢
Mesh 20, Nested, 5 doz.....	85¢ 1.00
Mesh 24, Nested, 5 doz.....	1.10
Slates-	
School, by case.....	50¢10¢
Snaps, Harness, &c.-	
Anchor (T. & S. Mfg. Co.).....	65¢
Fitch's (Bristol).....	50¢10¢
Hutchins.....	10¢
Andrews.....	50¢
Sargent's Patent Guarded.....	70¢10¢10¢
German, New list.....	60¢10¢
Covert, New Patent.....	50¢55¢
Covert, New R. E.....	60¢25¢
Covered Spring.....	60¢10¢10¢
Soldering Irons-	
Covey's Adjustable, list Jan. 1, 1888.....	35¢25¢
Spoke Shaves-	
Iron.....	45¢
Wood.....	30¢
Bayley's (Stanley R. & L. Co.).....	40¢10¢
Stearns.....	20¢10¢30¢
Spoke Trimmers-	
Bonney's.....	50¢10¢50¢
Stearns.....	20¢10¢
Ives, No. 1, \$15.00; No. 2, \$12.00 per doz.....	55¢10¢
Douglas.....	50¢10¢
Spoons and Forks-	
Trained Iron.....	70¢10¢
Basting, Cen. Stamp. Co.'s list.....	70¢10¢
Solid Table and Tea, Cen. Stamp. Co.'s list.....	70¢10¢
Buffalo S. S. & Co.....	38¢25¢
Silver-Plated-(4 mos. or 5¢ cash 30 days).....	
Meriden Brit. Co., Rogers.....	50¢
C. Rogers & Bro.....	50¢
Rogers & Bro.....	50¢
Reed & Barton.....	50¢
Wm. Rogers Mfg. Co.....	50¢10¢30¢
Simpson, Hall, Miller & Co.....	50¢10¢
Holmes & Edwards Silver Co.....	50¢10¢
H. & E. Silver Co., Mexican Silver.....	50¢55¢
H. & E. Silver Co., Durham Silver.....	50¢55¢
German Silver.....	50¢50¢55¢
German Silver, Hall & Elton.....	50¢55¢ cash
Nickel Silver.....	50¢55¢10¢55¢ cash
Britannia.....	50¢
Boardman's Flat Ware.....	50¢10¢
Boardman's Nickel Silver.....	50¢
Boardman's Britannia Spoons, case lots.....	60¢
Springs-	
Elliptic, Concord, Platform and Half Scroll.....	60¢60¢55¢
Cliff's Bolster Springs.....	25¢
Squares-	
Steel and Iron.....	75¢10¢80¢
Nickel-Plated.....	60¢10¢10¢70¢
Try Square and T Bevel.....	60¢10¢10¢70¢
Disston's Try Square and T Bevel.....	45¢10¢
Winterbottom's Try and Miter.....	80¢10¢
Starrett's Micrometer Caliper Squares.....	25¢
Avery's Flush Bevel Squares.....	30¢55¢
Staples-	
Fence Staples, Galvanized.....	Same price as Brd Wire
Fence Staples, Plain.....	See Trd Wire
Steelyards.....	
40¢10¢50¢	
Stocks and Dies-	
Blacksmith's.....	30¢55¢30¢10¢
Waterford Goods.....	30¢55¢30¢10¢
Butterfield's Goods.....	30¢55¢30¢10¢
Lightning Screw Plate.....	25¢30¢
Reece's New Screw Plates.....	35¢25¢40¢
Stone-	
Hindustan No. 1, 34; Axe, 34¢; Slips.....	
Do. 1, 44¢.....	
Sand Stone.....	2¢10¢
Washita Stone, Extra.....	10¢10¢20¢
Washita Stone, No. 1.....	14¢15¢
Washita Stone, No. 2.....	10¢11¢
Washita Slips, No. 1, Extra.....	24¢38¢
Washita Slips, No. 1.....	24¢25¢
Arkansas Stone, No. 1, 4 to 9 in.....	\$1.50
Arkansas Stone, No. 1, 6 to 9 in.....	\$1.50
Turkey Oil Stone, 4 to 8 in.....	40¢
Turkey Slips.....	\$1.00¢1.50
Lake Superior, Chase.....	15¢
Lake Superior Slips, Chase.....	31¢32¢
Seneca Stone, Red Paper Brand.....	15¢20¢
Seneca Stone, High Rounds.....	15¢20¢
Seneca Stone, Small Whets.....	25¢40¢
Stone Polish-	
Joseph Dixon's.....	50¢10¢
Gam.....	50¢10¢
Gold Medal.....	50¢10¢
Mirror.....	50¢10¢
Lustro.....	50¢10¢
Ruby.....	50¢10¢
Rising Sun, 5 gro lots.....	50¢10¢
Dixon's Plumbago.....	50¢10¢
Boynton's Noon Day.....	50¢10¢
Parlor Fringe Store Enamel.....	50¢10¢
Yates Liquid.....	50¢10¢
Yates Standard Paste Polish, 10-b cans.....	50¢10¢
Jet Black.....	50¢10¢
Japanese.....	50¢10¢
Freddie.....	50¢10¢
Diamond O. K. Enamel.....	50¢10¢
Bonnell's Liquid Stove Polish.....	50¢10¢
Bonnell's Paste Stove Polish.....	50¢10¢
Black Eagle Benzine Paste, 5 and 10 b cans.....	12¢15¢
Black Jack Water Paste, 5 and 10 b cans.....	12¢15¢
Nickel Plate Paste.....	50¢10¢
Tacks, Brads, &c.-	
List, Jan. 2, 1888.....	(Note.-Some manufacturers are selling Tacks at slightly higher prices than those named.)
American Iron Carpet.....	80¢80¢55¢
Steel Carpet.....	80¢80¢55¢
Swedes Iron Carpet.....	75¢75¢10¢
American Iron Cut.....	75¢75¢10¢
Swedes Iron.....	75¢75¢10¢
Swedes Iron, Upholsterers.....	75¢10¢75¢10¢55¢
Tinned Swedes Iron.....	75¢10¢75¢10¢55¢
Tinned Swedes Iron, Upholsterers.....	75¢10¢75¢10¢55¢
Gimp and Lace.....	75¢10¢75¢10¢55¢
Tinned Gimp and Lace.....	75¢10¢75¢10¢55¢
Swedes Iron Trimmers.....	75¢10¢75¢10¢55¢
Swedes Iron Miners.....	75¢10¢75¢10¢55¢
Swedes Iron Bill Posters, or Railroad.....	75¢10¢75¢10¢55¢
Swedes Steel (Swedes Iron price list).....	80¢80¢55¢
Copper Tacks.....	50¢10¢
Copper Finishing, Trunk and Clout Nails.....	50¢10¢
Finishing Nails.....	70¢10¢70¢10¢10¢
Trunk and Clout Nails.....	70¢10¢70¢10¢10¢
Tinned Trunk and Clout Nails.....	70¢10¢
Bucket Nails.....	70¢10¢70¢10¢10¢
Common and Patent Brads, 70¢10¢70¢	
Hungarian Nails.....	70¢10¢70¢10¢10¢
Chair Nails.....	70¢10¢70¢10¢10¢
Zinc Glaziers' Points.....	50¢50¢55¢
Cigar Box Nails.....	50¢10¢50¢10¢55¢
Picture-Frame Points.....	50¢10¢50¢10¢55¢
Looking-Glass Tacks.....	50¢10¢50¢10¢55¢
Leathered Carpet.....	50¢10¢50¢10¢55¢
Brush Tacks.....	50¢10¢50¢10¢55¢
Shoe Finders, list Jan. 2, 1888.....	10¢10¢
Linings and Saddle Nails, list Jan. 1, 1888.....	10¢10¢55¢
Silvered.....	30¢10¢10¢
Japanned.....	20¢10¢10¢
Double-Pointed Tacks.....	85¢
Wire Carpet Nails.....	50¢10¢
Wire Brads & Nails, see Nails, Wire.....	
Steel-Wire Brads, K. & E. Mfg. Co.'s list.....	50¢10¢
Tap Borers-	
Common and Rind.....	20¢10¢
Ive's Tap Borers.....	33¢10¢
Enterprise Mfg. Co.....	20¢10¢30¢
Clark's.....	33¢10¢35¢
Tapes, Measuring-	
American.....	25¢10¢
Spring.....	40¢
Chesterman's, Regular list.....	25¢30¢
Thermometers-	
Tin Case.....	80¢80¢10¢
Thimble Skins-See Skins.	
Ties, Bale-Steel	
Standard Wire, list.....	50¢10¢55¢
Tinners' Shears, &c.-	
Shears and Snips (P. S. & W.).....	20¢25¢
Punches, see Punches.....	
Snips, J. Mallinson & Co.....	33¢10¢
Tinware-	
Stamped, Japanned and Plated, list Jan. 20, 1887.....	75¢75¢55¢
Tire Benders, Upsetters, &c-	
Stoddard's Lightning Tire Upsetters.....	15¢
Detroit Perfected Tire Bender.....	15¢
Tobacco Cutters-	
Champion.....	20¢10¢30¢
Wood Bottom.....	50¢10¢55¢
All Iron.....	50¢10¢55¢
Nashua Lock Co.'s.....	50¢10¢55¢
Wilson's.....	50¢10¢55¢
Sargent's.....	50¢10¢55¢
Acme.....	50¢10¢55¢
Transom Lifters-	
Wellenak's.....	50¢
Class 3 and 4, Bronzed Iron.....	50¢
Class 3 and 4, Bronze Metal.....	25¢
Class 3 and 4, Brass.....	35¢
Skylight Lifters.....	35¢
Crown, Eagle and Shield.....	50¢
Reiber's.....	50¢
Iron Rods, list Jan. 1, 1887.....	50¢25¢
Real Bronze or Nickel Plate.....	50¢25¢
Excelsior.....	50¢10¢25¢
Shaw's.....	50¢10¢
Payson's Universal.....	40¢40¢10¢
Traps-	
Game.....	35¢40¢55¢
Newhouse.....	35¢40¢55¢
Onedda Pattern.....	70¢70¢55¢
Game, Blake's Patent.....	40¢10¢55¢
Mouse and Rat-	
Mouse Wood, Choker.....	50¢10¢
Mouse, Round Wire.....	50¢10¢
Mouse, Cage Wire.....	50¢10¢
Mouse, Catch-em-alive.....	50¢10¢
Mouse, "Bonanza".....	50¢10¢
Mouse Delusion.....	50¢10¢
Rat, Decoy.....	50¢10¢
Ideal.....	50¢10¢
Cyclone.....	50¢10¢
Hotchkiss Metallic Mouse, 5-hole.....	50¢10¢
In full cases.....	50¢10¢
Trowels-	
Lothrop's Brick and Plastering.....	25¢
Reed's Brick and Plastering.....	25¢
Disston's Brk and Plastering.....	25¢
Peace's Plastering.....	25¢
Clement & Maynard's.....	25¢
Rose's Brick.....	25¢
Brade's Brick.....	25¢
Worral's Brick and Plastering.....	25¢
Garden.....	70¢
Triers-	
Butter and cheese.....	25¢
Trucks, Warehouse, &c.-	
B. & L. Block Co.'s list.....	40¢
Tubes, Boiler-	
See Pipe.....	
Twine-	
Flax Twine.....	BC. B.
No. 9, 1/4 and 1/2 b Balls.....	22¢ 30¢
No. 12, 1/4 and 1/2 b Balls.....	21¢ 29¢
No. 18, 1/4 and 1/2 b Balls.....	18¢ 28¢
No. 24, 1/4 and 1/2 b Balls.....	18¢ 28¢
No. 30, 1/4 and 1/2 b Balls.....	16¢ 27¢
No. 36, 1/4 and 1/2 b Balls.....	14¢ 25¢
Chalk Line, Cotton, 1/4 b Balls.....	14¢ 25¢
Mason Line, Linen, 1/4 b Balls.....	14¢ 25¢
2-Ply Hemp, 1/4 and 1/2 b Balls (Spring Twine).....	11¢ 12¢
3-Ply Hemp, 1 b Balls.....	12¢ 12¢
3-Ply Hemp, 1 1/2 b Balls.....	11¢ 11¢
Cotton Wadding, 6 Balls to b.....	15¢ 18¢
2, 3, and 5-Ply Jute, 1/2 b Balls.....	10¢
Wool.....	10¢
Paper.....	10¢
Cotton Mops, 6, 9, 12 and 15 b to doz.....	18¢
Vices-	
Solid Box.....	60¢60¢55¢
Parallel.....	
Fisher & Norris Double Screw.....	15¢10¢
Stephens.....	25¢30¢
Parker's.....	
20¢25¢	
Wilson's.....	55¢
Bonney's.....	40¢
Flower's.....	40¢
Millers Falls.....	40¢40¢10¢
Trenton.....	40¢55¢40¢10¢
Merrill's.....	15¢20¢
Sargent's.....	60¢10¢10¢
Backus and Union.....	40¢
Double Screw Leg.....	15¢10¢
Prentiss.....	20¢55¢25¢
Simpson's Adjustable.....	40¢
Moore's.....	20¢
Saw Vices-	
Bonney's, Nos. 2 & 3.....	40¢10¢
Stearns.....	33¢10¢33¢10¢10¢
Stearns' Silent Saw Vices.....	33¢10¢35¢
Sargent's.....	60¢10¢
Hopkins.....	50¢10¢
Reading.....	40¢10¢
Ventworth.....	50¢10¢
Combination Hand Vices.....	50¢10¢
Cowell Hand Vices.....	50¢10¢
Bauer's Pipe Vices.....	10¢
Wagon Boxes-	
Per b.....	2¢10¢
Wagon Jacks-	
Daisy.....	50¢10¢
Washer Cutters-	
Smith's Pat.....	50¢10¢
Johnson's.....	50¢10¢
Penny's.....	50¢10¢
Appleton's.....	50¢10¢
Bonney's.....	50¢10¢
Washers-	
Size.....	1/8 5-16 3/8 1/2 5/8 3/4 1
Washers.....	7 5/8 1 1/4 1 1/2 1 3/4 2 1/4 3 1/4
In lots less than 200 b, 5 b, add 1/4¢, 5 b boxes 1¢ to list.	
Wedges-	
Iron.....	50¢10

Molasses Gates—	
Stebbin's Pat.	70¢ 70¢ 71¢
Stebbin's Genuine.	50¢ 10¢ 10¢
Stebbin's Tinned Ends.	40¢ 10¢
Chase's Hard Metal.	50¢ 10¢
Bush's.	30¢
Lincoln's Pattern.	70¢ 70¢ 10¢
Wood's.	30¢ 10¢
Ross, P. dos:	
No. 1, 77; No. 2, 83; No. 3, 89; No. 4, 10.	60¢ 10¢ 10¢
Money Drawers—	
Muzzies—	50¢ 10¢ 10¢
Safety—	50¢ 10¢ 10¢

Nails, see Trade Report.

Wire Nails & Brads, list July 14, '87	70¢ 10¢
Wire Nails, Standard Penny.	50¢ 10¢
	50¢ 10¢ 10¢

Nail Puller—

Curtis Hammer.	50¢ 10¢ 10¢
Grant, No. 1.	50¢ 10¢ 10¢
Pelican.	50¢ 10¢ 10¢
Ross.	50¢ 10¢ 10¢
Lighting.	50¢ 10¢ 10¢

Nail Sets—

Square.	50¢ 10¢ 10¢
Round.	50¢ 10¢ 10¢
Cannon's Diamond Point.	50¢ 10¢ 10¢

Nut Crankers—

Table (H. & B. Mfg. Co.).	50¢ 10¢ 10¢
Blake's Pattern.	50¢ 10¢ 10¢
Turner & Seymour Mfg. Co.	50¢ 10¢ 10¢

Nuts—

Nuts off list Jan. 1, 1888: Square. Hex.	50¢ 10¢ 10¢
Hot Pressed.	50¢ 10¢ 10¢
Cold Punched.	50¢ 10¢ 10¢
In lots less than 100 lb.	50¢ 10¢ 10¢
boxes, add 1¢ to list.	

Oakum—

Government.	50¢ 10¢ 10¢
U. S. Navy.	50¢ 10¢ 10¢
Navy.	50¢ 10¢ 10¢

Oilers—

Zinc and Tin.	50¢ 10¢ 10¢
Brass and Copper.	50¢ 10¢ 10¢
Malleable, Improved, No. 1.	50¢ 10¢ 10¢
No. 2, 44.00; No. 3, 44.40	50¢ 10¢ 10¢
Malleable, Hammers, Old Pattern, same list	50¢ 10¢ 10¢
Prior's Pat. or "Paragon" Zinc.	50¢ 10¢ 10¢
Prior's Pat. or "Paragon" Brass.	50¢ 10¢ 10¢
Olmed's Tin and Zinc.	50¢ 10¢ 10¢
Olmed's Brass and Copper.	50¢ 10¢ 10¢
Broughton's Zinc.	50¢ 10¢ 10¢
Broughton's Brass.	50¢ 10¢ 10¢

Packing, Steam—

Rubber.	50¢ 10¢ 10¢
Standard.	50¢ 10¢ 10¢
Extra.	50¢ 10¢ 10¢
N. Y. B. & P. Co., Standard.	50¢ 10¢ 10¢
N. Y. B. & P. Co., Empire.	50¢ 10¢ 10¢
N. Y. B. & P. Co., Salamander.	50¢ 10¢ 10¢
Jenkins' Standard.	50¢ 10¢ 10¢

Miscellaneous—

American Packing.	50¢ 10¢ 10¢
Russia Packing.	50¢ 10¢ 10¢
Italian Packing.	50¢ 10¢ 10¢
Cotton Packing.	50¢ 10¢ 10¢
Jute.	50¢ 10¢ 10¢

Padlocks—

See Locks.	50¢ 10¢ 10¢
Pails—	50¢ 10¢ 10¢
Galvanized Iron—	50¢ 10¢ 10¢
Quarts.	50¢ 10¢ 10¢
Hill's Light Weight.	50¢ 10¢ 10¢
Hill's Heavy Weight.	50¢ 10¢ 10¢
Whiting's.	50¢ 10¢ 10¢
Stdney Shephard & Co.	50¢ 10¢ 10¢
Iron Clad.	50¢ 10¢ 10¢
Fire Buckets.	50¢ 10¢ 10¢
Buckets, see Well Buckets.	

Indurated Fibre Ware—

Star Pails, 13 qt.	50¢ 10¢ 10¢
Fire, Stable and Milk, 14 qt.	50¢ 10¢ 10¢

Pencils—

Faber's Carpenters'.	50¢ 10¢ 10¢
Faber's Round Gilt.	50¢ 10¢ 10¢
Dixon's Lead.	50¢ 10¢ 10¢
Dixon's Lumber.	50¢ 10¢ 10¢
Dixon's Carpenters'.	50¢ 10¢ 10¢

Picks—

Railroad or Adse Eye, 5 to 6, 12.00;	50¢ 10¢ 10¢
6 to 7, 13.00.	50¢ 10¢ 10¢

Picture Nails—

Brass Head, Sargent's list.	50¢ 10¢ 10¢
Brass Head, Combination list.	50¢ 10¢ 10¢
Porcelain Head, Sargent's list.	50¢ 10¢ 10¢
Porcelain Head, Combination list.	50¢ 10¢ 10¢
Niles' Patent.	50¢ 10¢ 10¢

Pinking Irons—

Pipe, Wrought Iron—	50¢ 10¢ 10¢
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1½ and under, Plain	50¢ 10¢ 10¢
1½ and under, Galvanized	50¢ 10¢ 10¢
1½ and over, Plain	50¢ 10¢ 10¢
1½ and over, Galvanized	50¢ 10¢ 10¢
Boiler Tubes, Iron.	50¢ 10¢ 10¢

Planes and Plane Irons—

Wood Planes—	50¢ 10¢ 10¢
Molding.	50¢ 10¢ 10¢
Beach, First Quality.	50¢ 10¢ 10¢
Beach, Second Quality.	50¢ 10¢ 10¢
Bell's (Stanley R. & L. Co.).	50¢ 10¢ 10¢

Iron Planes—

Bailey's (Stanley R. & L. Co.).	50¢ 10¢ 10¢
Miscellaneous Planes (Stanley R. & L. Co.).	50¢ 10¢ 10¢
Victor Planes (Stanley R. & L. Co.).	50¢ 10¢ 10¢
Steele's Iron Planes.	50¢ 10¢ 10¢
Meriden Mal. Iron Co.'s.	50¢ 10¢ 10¢
Davis's Iron Planes.	50¢ 10¢ 10¢
Birmingham Plane Co.	50¢ 10¢ 10¢
Oage Tool Co.'s Self-Setting.	50¢ 10¢ 10¢
Chaplin's Iron Planes.	50¢ 10¢ 10¢
Sargent's.	50¢ 10¢ 10¢

Plane Irons—

Plane Irons.	50¢ 10¢ 10¢
Plane Irons, Butcher's.	50¢ 10¢ 10¢
Plane Irons, Buck Bros.	50¢ 10¢ 10¢
Plane Irons, Auburn Tool Co., "This file"	50¢ 10¢ 10¢
Sandusky Tool Co.	50¢ 10¢ 10¢
Single and Cut.	50¢ 10¢ 10¢
Double.	50¢ 10¢ 10¢
L. & I. J. White.	50¢ 10¢ 10¢

Pliers and Nippers—

Button's Patent.	50¢ 10¢ 10¢
Hall's No. 2, 5 in., 13.50; No. 4, 7 in.	50¢ 10¢ 10¢
\$21.00	50¢ 10¢ 10¢
Humason & Beckley Mfg. Co.	50¢ 10¢ 10¢
Gas Pliers.	50¢ 10¢ 10¢
Gas Pliers, Custer's Nickel Plated.	50¢ 10¢ 10¢
Eureka Pliers and Nippers.	50¢ 10¢ 10¢
Russell's Parallel.	50¢ 10¢ 10¢
P. S. & W. Cast Steel.	50¢ 10¢ 10¢
P. S. & W. Tinner's Cutting Nippers.	50¢ 10¢ 10¢
Carew's Pat. Wire Cutters.	50¢ 10¢ 10¢
Morrill's Parallel.	50¢ 10¢ 10¢
Cronk's 8 in., 15.00; 10 in., 21.00.	50¢ 10¢ 10¢

Plumbs and Levels—

Regular List.	50¢ 10¢ 10¢
Diston's.	50¢ 10¢ 10¢
Pocket Levels.	50¢ 10¢ 10¢
Davis Iron Levels.	50¢ 10¢ 10¢
Davis' Inclometers.	50¢ 10¢ 10¢

Polish, Metal.

Prestolite.	50¢ 10¢ 10¢
Kretzschmar.	50¢ 10¢ 10¢
Gaston's Silver Compound.	50¢ 10¢ 10¢

Pokes, Animal—

Bishop's I. X. L.	50¢ 10¢ 10¢
Bishop's O. K.	50¢ 10¢ 10¢
Bishop's Pioneer.	50¢ 10¢ 10¢
Bishop's American.	50¢ 10¢ 10¢

Peppers, Corn—

Round or Square, 1 qt.	50¢ 10¢ 10¢
Round or Square, 2 qt.	50¢ 10¢ 10¢

Post Hole and Tree Augers and Diggers—

Samson Post Hole Digger.	50¢ 10¢ 10¢
Fletcher Post Hole Augers.	50¢ 10¢ 10¢
Eureka Diggers.	50¢ 10¢ 10¢
Lead's.	50¢ 10¢ 10¢
Vaughan's Post Hole Auger.	50¢ 10¢ 10¢
Kohler's Little Giant.	50¢ 10¢ 10¢
Kohler's Hercules.	50¢ 10¢ 10¢
Kohler's New Champion.	50¢ 10¢ 10¢
Schneider.	50¢ 10¢ 10¢
Ryan's Post Hole Diggers.	50¢ 10¢ 10¢
Cronk's Post Bars.	50¢ 10¢ 10¢
Gibb's Post Hole Digger.	50¢ 10¢ 10¢

Potato Parers—

White Mountain.	50¢ 10¢ 10¢
Antrim Combination.	50¢ 10¢ 10¢
Rooster.	50¢ 10¢ 10¢

Pruning Hooks and Shears—

Diston's Combined Pruning Hook and Saw.	50¢ 10¢ 10¢
Diston's Pruning Hook.	50¢ 10¢ 10¢
E. S. Lee & Co.'s Pruning Tools.	50¢ 10¢ 10¢
Pruning Shears, Henry's Pat.	50¢ 10¢ 10¢
Henry's Pruning Shears.	50¢ 10¢ 10¢
Wheeler, M. & C. Co.'s Combination.	50¢ 10¢ 10¢
Dunlap's Saw and Chisel.	50¢ 10¢ 10¢
J. Mallinson & Co., No. 1, 45.25; No. 2, 7.25	50¢ 10¢ 10¢

Pulleys—

Hot House, Awning, &c.	50¢ 10¢ 10¢
Japanned Screw.	50¢ 10¢ 10¢
Brass Screw.	50¢ 10¢ 10¢
Japanned Side.	50¢ 10¢ 10¢
Japanned Clothes Line.	50¢ 10¢ 10¢
Empire Sash Pulley.	50¢ 10¢ 10¢
Moore's Sash, Anti-Friction.	50¢ 10¢ 10¢
Hay Fork, Solid Eye, 10.00; Swivel.	50¢ 10¢ 10¢
Hay Fork, "Anti-Friction," 5 in. Solid.	50¢ 10¢ 10¢
Hay Fork, "F" Common and Pat.	50¢ 10¢ 10¢
Hay Fork, Tarbox Pat. Iron.	50¢ 10¢ 10¢
Hay Fork, Reed's Self-Lubricating.	50¢ 10¢ 10¢
Shade Rack.	50¢ 10¢ 10¢
Tackle Blocks.	50¢ 10¢ 10¢
Moore's Anti-Friction 5 in. Wheel.	50¢ 10¢ 10¢

Pumps—

Cistern, Best Makers.	50¢ 10¢ 10¢
Pitcher Spout, Best Makers.	50¢ 10¢ 10¢
Pitcher Spout, Cheaper Goods.	50¢ 10¢ 10¢

Punches—

Saddlers' or Drive, good.	50¢ 10¢ 10¢
Bemis & Call Co.'s Cast Steel Drive.	50¢ 10¢ 10¢
Bemis & Call Co.'s Springfield Socket.	50¢ 10¢ 10¢
Spring, good quality.	50¢ 10¢ 10¢
Spring, Leach's Pat.	50¢ 10¢ 10¢
Bemis & Call Co.'s Spring and Check.	50¢ 10¢ 10¢
Solid Tinner's.	50¢ 10¢ 10¢
Tinner's Hollow Punches.	50¢ 10¢ 10¢
Rice Hand Punches.	50¢ 10¢ 10¢
Avery's Revolving.	50¢ 10¢ 10¢
Avery's Saw-Set and Punch. See Saw Sets.	

Rail—

Sliding Door, Wrt Brass.	50¢ 10¢ 10¢
Sliding Door, Bronzed Wrt Iron.	50¢ 10¢ 10¢
Sliding Door, Iron, Painted.	50¢ 10¢ 10¢
Barn Door, Light, In.	50¢ 10¢ 10¢
Per 100 feet.	50¢ 10¢ 10¢
B. D. for N. E. Hangers.	50¢ 10¢ 10¢
Small, Med. Large.	50¢ 10¢ 10¢
Per 100 feet.	50¢ 10¢ 10¢
Terry's Wrought Iron.	50¢ 10¢ 10¢
Victor Track Rail, 7½ foot.	50¢ 10¢ 10¢
Carrier Steel Rail, 7 foot.	50¢ 10¢ 10¢
Moore's Wrought Iron.	50¢ 10¢ 10¢

Rakes—

Cast Steel, Association goods.	50¢ 10¢ 10¢
Cast Steel, outside goods.	50¢ 10¢ 10¢
Malleable.	50¢ 10¢ 10¢
Gibbs Lawn Rake.	50¢ 10¢ 10¢
Canton Lawn Rake.	50¢ 10¢ 10¢
Fort Madison Prize Bow Rake and Peerless.	50¢ 10¢ 10¢
Fort Madison Steel Tooth Lawn Rake.	50¢ 10¢ 10¢

Razors—

J. R. Torrey Razor Co.	50¢ 10¢ 10¢
Wostenholme and Butcher.	50¢ 10¢ 10¢

Razor Straps—

Genuine Emerson.	50¢ 10¢ 10¢
Imitation.	50¢ 10¢ 10¢
Torrey's.	50¢ 10¢ 10¢
Badger's Belt and Com.	50¢ 10¢ 10¢
Lamont Combination.	50¢ 10¢ 10¢

Rivets and Burrs—

Copper.	50¢ 10¢ 10¢
Iron, list Nov. 17, '87.	50¢ 10¢ 10¢

Rivet Sets.

Reds—	50¢ 10¢ 10¢
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Stair, Brass.	50¢ 10¢ 10¢
Stair, Black Walnut.	50¢ 10¢ 10¢

Rollers—

Barn Door, Sargent's list.	50¢ 10¢ 10¢
Acme Moore's Anti-Friction.	50¢ 10¢ 10¢
Union Barn Door Roller.	50¢ 10¢ 10¢

Rope—

Manufacturers' prices for large lots:	
Manila, ¼ in. and larger.	50¢ 10¢ 10¢
Manila, ½ in. and 1 in.	50¢ 10¢ 10¢
Manila, 1½ in. and 2 in.	50¢ 10¢ 10¢
Manila, 2½ in. and 3 in.	50¢ 10¢ 10¢
Manila, 3½ in. and 4 in.	50¢ 10¢ 10¢
Manila, 4½ in. and 5 in.	50¢ 10¢ 10¢
Manila, 5½ in. and 6 in.	50¢ 10¢ 10¢
Manila, 6½ in. and 7 in.	50¢ 10¢ 10¢
Manila, 7½ in. and 8 in.	50¢ 10¢ 10¢
Manila, 8½ in. and 9 in.	50¢ 10¢ 10¢
Manila, 9½ in. and 10 in.	50¢ 10¢ 10¢
Manila, 10½ in. and 11 in.	50¢ 10¢ 10¢
Manila, 11½ in. and 12 in.	50¢ 10¢ 10¢
Manila, 12½ in. and 13 in.	50¢ 10¢ 10¢
Manila, 13½ in. and 14 in.	50¢ 10¢ 10¢
Manila, 14½ in. and 15 in.	50¢ 10¢ 10¢
Manila, 15½ in. and 16 in.	50¢ 10¢ 10¢
Manila, 16½ in. and 17 in.	50¢ 10¢ 10¢
Manila, 17½ in. and 18 in.	50¢ 10¢ 10¢
Manila, 18½ in. and 19 in.	50¢ 10¢ 10¢
Manila, 19½ in. and 20 in.	50¢ 10¢ 10¢
Manila, 20½ in. and 21 in.	50¢ 10¢ 10¢
Manila, 21½ in. and 22 in.	50¢ 10¢ 10¢
Manila, 22½ in. and 23 in.	50¢ 10¢ 10¢
Manila, 23½ in. and 24 in.	50¢ 10¢ 10¢
Manila, 24½ in. and 25 in.	50¢ 10¢ 10¢
Manila, 25½ in. and 26 in.	50¢ 10¢ 10¢
Manila, 26½ in. and 27 in.	50¢ 10¢ 10¢
Manila, 27½ in. and 28 in.	50¢ 10¢ 10¢
Manila, 28½ in. and 29 in.	50¢ 10¢ 10¢
Manila, 29½ in. and 30 in.	50¢ 10¢ 10¢
Manila, 30½ in. and 31 in.	50¢ 10¢ 10¢
Manila, 31½ in. and 32 in.	50¢ 10¢ 10¢
Manila, 32½ in. and 33 in.	50¢ 10¢ 10¢
Manila, 33½ in. and 34 in.	50¢ 10¢ 10¢
Manila, 34½ in. and 35 in.	50¢ 10¢ 10¢
Manila, 35½ in. and 36 in.	50¢ 10¢ 10¢
Manila, 36½ in. and 37 in.	50¢ 10¢ 10¢
Manila, 37½ in. and 38 in.	50¢ 10¢ 10¢
Manila, 38½ in. and 39 in.	50¢ 10¢ 10¢
Manila, 39½ in. and 40 in.	50¢ 10¢ 10¢
Manila, 40½ in. and 41 in.	50¢ 10¢ 10¢
Manila, 41½ in. and 42 in.	50¢ 10¢ 10¢
Manila, 42½ in. and 43 in.	50¢ 10¢ 10¢
Manila, 43½ in. and 44 in.	50¢ 10¢ 10¢
Manila, 44½ in. and 45 in.	50¢ 10¢ 10¢
Manila, 45½ in. and 46 in.	50¢ 10¢ 10¢</

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Melasses Gates—

Stebbin's Pat.	70¢@70¢7½
Stebbin's Genuine.	60¢@10¢10½
Stebbin's Tinned Ends.	40¢@10¢
Chase's Hard Metal.	50¢@10¢
Bush's.	30¢
Lincoln's Pattern.	70¢@70¢10
Wood's.	30¢@10¢

Boss, 7 dos:
No. 1, 7; No. 2, 8; No. 3, 8; No. 4, 10.
60¢@10¢10½

Money Drawers. 7 dos, \$12@20

Muzzles—

Safety. 7 dos, \$3.00, 25¢

Nails, see Trade Report.

Wire Nails & Brads, list July 14, '87

Wire Nails, Standard Penny. 7 dos, \$2.50@2.60

Nail Puller—

Curtis Hammer.	7 dos, \$2, net
Giant, No. 1.	7 dos, \$3.00, 10¢
Pelican.	7 dos, \$2.00, 25¢
Boss.	7 dos, \$3.00, 30¢
Lighting.	7 dos, \$2.00

Nail Sets—

Square.	7 gr., \$4.00@4.25
Round.	7 gr., \$3.25
Canon's Diamond Point.	7 gr., \$12, 20¢

Nut Crankers—

Table (H. & B. Mfg. Co.).	40¢
Blake's Pattern.	7 dos, \$2.00, 10¢
Turner & Seymour Mfg. Co.	50¢

Nuts—

Nuts, off list Jan. 1, 1888: Square. Hex.
Hot Pressed. 5.4¢ 5.9¢
Cold Punched. 5.4¢ 5.5¢
In lots less than 100 lb, 7 lb, add ¼¢; 1-b
boxes, add 1¢ to list.

Oakum—

Government.	7 lb 7½¢ @ 8¢
U. S. Navy.	7 lb 6½¢ @ 7¢
Navy.	7 lb 5½¢ @ 6½¢

Oilers—

Zinc and Tin.	65¢@65¢10¢
Brass and Copper.	50¢@10¢50¢10¢5½
Malleable, Hammers, Improved, No. 1.	\$3.00; No. 2, \$4.00; No. 3, \$4.40 7 dos.
10¢@10¢10¢	
Malleable, Hammers, Old Pattern, same	
list.	40¢
Prior's Pat. or "Paragon" Zinc.	60¢@10¢10½
Prior's Pat. or "Paragon" Brass.	60¢
Olmstead's Tin and Zinc.	60¢
Olmstead's Brass and Copper.	60¢
Broughton's Zinc.	60¢
Broughton's Brass.	60¢

Packing, Steam—

Standard.	60¢@10¢60¢10¢10½
Extra.	60¢@10¢60¢
N. Y. B. & P. Co., Standard.	60¢@10¢55¢
N. Y. B. & P. Co., Empire.	70¢
N. Y. B. & P. Co., Salamander.	7¢ 65¢, 80¢
Jenkins' Standard.	7¢ 80¢, 85¢

Miscellaneous—

American Packing.	10¢@11¢ 7 lb
Russia Packing.	11¢@11¢ 7 lb
Italian Packing.	13¢@14¢ 7 lb
Cotton Packing.	15¢@17¢ 7 lb
Jute.	7¢@8¢ 7 lb

Padlocks—**See Locks.****Pails—**

Galvanized Iron—	
Quarts.	10 12 14
Hill's Light Weight.	7 dos, \$2.75 3.00 3.25
Hill's Heavy Weight.	7 dos, 3.00 3.25 3.75
Whiting's.	2.75 3.00 3.25
Sidney Shephard & Co.	2.80 3.00 3.40
Iron Clad.	2.75 3.00 3.25
Fire Buckets.	2.75 3.25 3.50
Buckets, see Well Buckets.	

Indurated Fibre Ware—

Star Exels, 12 qt.	7 dos, \$4.50
Fire, Stable and Milk, 14 qt.	7 dos, \$5.85

Pencils—

Faber's Carpenters'.	high list 50¢
Faber's Round Gilt.	7 gr, \$5.95
Dixon's Lead.	7 gr, \$4.50
Dixon's Lumber.	7 gr, \$6.75
Dixon's Carpenters'.	40¢@10¢

Picks—

Railroad or Adse Eye, 5 to 6, \$12.00;	
6 to 7, \$13.00.	60¢@50¢10¢

Picture Nails—

Brass Head, Sargent's list.	50¢@10¢10½
Brass Head, Combination list.	50¢@10¢
Porcelain Head, Sargent's list.	50¢@10¢10½
Porcelain Head, Combination list.	40¢@10¢
Niles' Patent.	40¢

Pinking Irons— 7 dos 65¢ net**Pipe, Wrought Iron—**

14 and under, Plain.	55¢
14 and under, Galvanized.	60¢
14 and over, Plain.	55¢
14 and over, Galvanized.	65¢
Boiler Tubes, Iron.	60¢@2½¢

Planes and Plane Irons—

Wood Planes—	
Molding.	50¢@50¢10¢
Bench, First Quality.	60¢@60¢55¢
Bench, Second Quality.	60¢@60¢10¢10½
Bailey's (Stanley R. & L. Co.).	40¢@10¢

Iron Planes—

Bailey's (Stanley R. & L. Co.).	40¢@10¢
Miscellaneous Planes (Stanley R. & L. Co.).	30¢@10¢
Victor Plane (Stanley R. & L. Co.).	30¢@10¢
Steer's Iron Planes.	35¢@35¢55¢
Meriden Mal. Iron Co.'s.	30¢@10¢30¢10¢10½
Davis's Iron Planes.	30¢@10¢30¢10¢10½
Birmingham Plane Co.	50¢@50¢55¢
Gage Tool Co.'s Self-Setting.	20¢@10¢
Chaplin's Iron Planes.	40¢@40¢55¢
Sargent's.	30¢@10¢30¢10¢10½

Plane Irons—

Plane Irons.	20¢@10¢
Plane Irons, Butcher's.	\$5.00@5.25 to 2
Plane Irons, Buck Bros.	30¢
Plane Irons, Auburn Tool Co., "This	40¢
tle"	
Sandusky Tool Co.	40¢
Single and Cut.	30¢
Double.	40¢
L. & I. J. White.	25¢

Pliers and Nippers—

Button's Patent.	30¢@10¢40¢
Hall's No. 2, 5 in., \$13.50; No. 4, 7 in.	\$21.00 7 dos
Humason & Beckley Mfg. Co.	50¢@50¢10¢
Gas Pliers.	60¢
Gas Pliers, Custard's Nickel Plated.	60¢55¢
Eureka Pliers and Nippers.	40¢
Russell's Parallel.	25¢
P. S. & W. Cast Steel.	50¢
P. S. & W. Tinnars' Cutting Nippers,	add 6¢ dis 10¢
Carew's Pat. Wire Cutters.	30¢
Morrill's Parallel.	7 dos, \$12.00, 30¢55¢
Cronk's 5 in., \$15.00; 10 in. \$21.00.	40¢@40¢55¢

Plumbs and Levels—

Regular List.	70¢@10¢70¢10¢10½
Diaston's.	70¢@10¢70¢10¢10½
Pocket Levels.	70¢@10¢70¢10¢10½
Davis Iron Levels.	30¢
Davis' Inclinoimeters.	10¢@10¢

Polish, Metal.

Prestoline.	20¢@10¢
Krestoline Paste.	34¢
Gaston's Silver Compound.	34¢

Pokes, Animal—

Bishop's I. X. L.	7 dos, \$5.50
Bishop's O. C.	7 dos, \$5.50
Bishop's Pioneer.	7 dos, \$3.75
Bishop's American.	7 dos, \$3.00

Peppers, Corn—

Round or Square, 1 qt.	7 gr, \$12.00@15.00
Round or Square, 2 qt.	7 gr, \$25.00@26.00

Post Hole and Tree Augers and Diggers—

Samson Post Hole Digger.	7 dos, \$36.00.
Fletcher Post Hole Augers.	7 dos, \$36, 20¢
Eureka Diggers.	7 dos, \$16.00@17.00
Lead's.	7 dos, \$3.00@4.00
Vaughan's Post Hole Auger.	7 dos, \$13.00@14.00
Kohler's Little Giant.	7 dos, \$18.00
Kohler's Hercules.	7 dos, \$15.00
Kohler's New Champion.	7 dos, \$9.00
Schneider.	7 dos, \$18.00
Ryan's Post Hole Diggers.	7 dos, \$24.00
Cronk's Post Bars.	7 dos, \$60.00.
Gibb's Post Hole Digger.	7 dos, \$30.00, 40¢@40¢10¢

Potato Parers—

White Mountain.	7 dos, \$5.00@5.50
Antrim Combination.	7 dos, \$5.00
Hoosier.	7 dos, \$13.50

Pruning Hooks and Shears—

Diaston's Combined Pruning Hook and	
Saw.	7 dos, \$18.00, 20¢@10¢
Diaston's Pruning Hook.	7 dos, \$12.00.
E. S. Lee & Co.'s Pruning Tools.	7 dos, 40¢
Pruning Shears, Henry's Pat.	7 dos, \$3.75@4.00 net
Henry's Pruning Shears.	7 dos, \$4.25@4.50 net
Wheeler, M. & C. Co.'s Combination.	7 dos, \$12.00, 20¢
Dunlap's Saw and Chisel.	7 dos, \$3.50, 80¢
J. Mallinson & Co., No. 1, \$5.25; No. 2, 7.25	

Pulleys—

Hot House, Awning, &c.	60¢@10¢
Japanned Screw.	60¢@10¢
Brass Screw.	60¢@10¢
Japanned Side.	60¢@10¢
Japanned Clothes Line.	60¢@10¢
Empire Sash Pulley.	60¢@10¢
Moore's Sash, Anti-Friction.	50¢
Hay Fork, Solid Eye, \$1.00; Swivel.	\$1.50.
Hay Fork, "Anti-Friction," 5 in. Solid.	50¢
Hay Fork, "F" Common and Pat.	50¢
Hay Fork, Tarpaulin Pat. Iron.	20¢
Hay Fork, Reed's Self-Lubricating.	60¢
Shade Rack.	45¢
Tackle Blocks.	See Blocks
Moore's Anti-Friction 5 in. Wheel.	7 dos, \$12.00.

Pumps—

Clatren, Best Makers.	50¢@10¢60¢
Pitcher Spout, Best Makers.	60¢@10¢60
Pitcher Spout, Cheaper Goods.	70¢@10¢55¢

Punches—

Saddlers' or Drive, good.	7 dos, 60¢@65¢
Bemis & Call Co.'s Cast Steel Drive.	50¢55¢
Bemis & Call Co.'s Springfield Socket.	50¢55¢
Spring, good quality.	7 dos, \$2.50@2.60
Spring, Leach's Pat.	15¢
Bemis & Call Co.'s Spring and Check.	40¢
Solid Tinnars'.	7 dos, \$1.44, 55¢
Tinnars' Hollow Punches.	30¢@25¢
Rice Hand Punches.	30¢@10¢
Avery's Revolving.	30¢@10¢
Avery's Saw-Set and Punch. See Saw Sets.	

Rail—

Sliding Door, Wrt Brass.	7 lb 35¢.
Sliding Door, Bronzed Wrt Iron.	7 lb, ft. 7.
Sliding Door, Iron, Painted.	7 foot 4¢, 40¢
Barn Door, Light. In.	7 foot 4¢
Per 100 feet.	\$2.00 2.50 3.10, 10¢
B. D. for N. E. Hangers—	
Per 100 feet.	Small. Med. Large.
	\$2.15 2.70 3.25

Terry's Wrought Iron.	7 foot, 4¢ (net)
Victor Track Rail, 7½ foot.	60¢@2¢
Carrier Steel Rail.	7 foot, 4¢
Moore's Wrought Iron.	25¢

Rakes—

Cast Steel, Association goods.	55¢
Cast Steel, outside goods.	60¢@10¢70¢
Malleable.	70¢@70¢55¢
Gibbs Lawn Rake.	\$12.00, 50¢
Canton Lawn Rake.	\$9.00, 50¢
Pt. Madison Prize Bow Brace and Peer-	less
Fort Madison Steel Tooth Lawn Rake.	\$6.00.

Razors—

J. R. Torrey Razor Co.	20¢
Wostenholme and Butcher, \$10.00 to 10¢	10¢

Razor Straps—

Genuine Emerson.	60¢@60¢55¢
Imitation.	7 dos, \$2.00, 20¢@10¢55¢
Torrey's.	20¢
Badger's Belt and Com.	7 dos, \$2.00
Lamont Combination.	7 dos, \$4.00

Rivets and Burrs—

Copper.	50¢
Iron, list Nov. 17, '87.	50¢

Rivet Sets—

	50¢@10¢
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Reds—

Stair, Brass.	25¢@25¢
Stair, Black Walnut.	7 dos, 40¢

Rollers—

Barn Door, Sargent's list.	60¢@10¢10¢
Acme Moore's Anti-Friction.	55¢
Union Barn Door Roller.	70¢

Rope—

Manufacturers' prices for large lots:	
Manila, ¼ in. and larger.	7 lb, 15¢
Manila, ½ in. and 5-16 in.	7 lb, 15¢
Manila, Tanned Rope.	7 lb, 15¢
Manila, Hay Rope.	7 lb, 15¢
Sisal, ¼ inch and larger.	7 lb, 12¢
Sisal, ½ in. and 5-16 in.	7 lb, 13¢
Sisal, ¾ in. and 5-16 in.	7 lb, 12¢
Sisal, Hay Rope.	7 lb, 12¢
Sisal, Tanned Rope.	7 lb, 12¢
Sisal, Medium Lathe Yarn.	7 lb, 11¢
Cotton Rope.	7 lb, 15¢
Jute Rope.	7 lb, 15¢

Rules—

Boxwood.	80¢@10¢80¢10¢10½
Ivory.	50¢@50¢10¢
Starrett's Rules and Straight Edges.	25¢@10¢

Sad Irons—

From 4 to 10, at factory.	7 100 lb.
Self-Heating.	7 dos, \$2.50
Self-Heating, Tailors'.	7 dos, \$5.00 net
Gleason's Shield and Toilet.	25¢
Mrs. Pott's Irons.	40¢@40¢55¢
Enterprise Star Irons.	40¢
Combined Fluter and Sad Iron.	7 dos, \$15.00, dis 15¢
Fox Reversible, Self-Fluter.	7 dos, \$24.00 net
Chinese Laundry (N. E. Butt Co.) 8½ in.	15¢
New England.	5¢, 15¢
Mahony's Troy Pol. Irons.	25¢
Sensible.	20¢@20¢55¢
National Self-Heating.	30¢

Sand and Emery Paper and Cloth—

List April 19, 1886.	40¢@10¢50¢
Sibley's Emery and Crocus Cloth.	30¢

Sash Cord—

Common.	7 lb, 10¢@11¢
Patent, good quality.	7 lb, 13¢@13½¢
White Cotton Braided, fair.	7 lb, 23¢@23½¢
Common Russia Sash.	7 lb, 13¢
Patent.	7 lb, 15¢
Cable Laid Italian Sash.	7 lb, 22¢@23½¢
India Cable Laid.	7 lb, 13¢

Silver Lake—

A Quality, White, 50¢.	10¢@10¢55¢
A Quality, Drab, 55¢.	10¢@10¢55¢
B Quality, White, 50¢.	20¢@10¢55¢
B Quality, Drab, 55¢.	20¢@10¢55¢
C Quality, White (only).	20¢@10¢55¢
Sylvan Spring, Extra Braided, White, 34¢	
Sylvan Spring, Extra Braided, Drab, 34¢	
Semper Idem, Braided, White.	30¢
Egyptian, India Hemp, Braided.	25¢

Samson—

Braided, White Cotton, 50¢.	30¢@30¢55¢
Braided, Drab Cotton, 55¢.	30¢@30¢55¢
Braided, Italian Hemp, 55¢.	30¢@30¢55¢
Braided, Linen, 80¢.	30¢@30¢55¢

Sash Locks—

Universal, 301	301
Kempshall's Gravity	60¢
Kempshall's Model	60¢@10¢42¢
W. C. Bailey, list Feb. 16,	60¢@10¢42¢
Rayson's Perfect	60¢@10¢42¢
Huggins's Saw Balances	25¢@33¢45¢
Huggins's New Saw Locks	25¢@33¢45¢
Stoddard "Practical"	10¢
Waters' Patent	60¢@10¢42¢
W. C. Bailey, Nos. 100 and 110, 7 gr	60¢@10¢42¢
106, \$10.00	60¢@10¢42¢
Davis, Bronze, Barnes Mfg. Co.	50¢
Champion Safety, list March 1, 1888	55¢@55¢60¢
Security	70¢
Buckeye	7 gr \$4.00

Machine—	
Flat Head, Iron.....	55¢
Round Head, Iron.....	50¢
Bench and Hand—	
Bench, Iron.....	55¢10¢55¢10¢10¢
Bench, Wood, Beech.....	55¢10¢55¢10¢10¢
Bench, Wood, Hickory.....	20¢10¢
Hand, Wood.....	25¢10¢55¢10¢55¢
Lag, Blunt Point.....	75¢75¢10¢
Coch and Lag, Gimlet Point.....	25¢55¢
Red.....	25¢55¢
Hand Rail, Sargent's.....	60¢10¢10¢
Hand Rail, H. & B. Mfg. Co.....	70¢10¢10¢
Hand Rail, Am. Screw Co.....	75¢
Jack Screws, Millers Falls list.....	50¢50¢55¢
Jack Screws, P. S. & W.....	35¢
Jack Screws, Sargent.....	50¢10¢50¢10¢55¢
Jack Screws, Stearns.....	40¢40¢10¢
Scroll Saws—	
Lester, complete, \$10.00.....	25¢
Rogers, complete, \$4.00.....	25¢
Barnes' Builders' and Cabinet Makers'.....	25¢
Barnes' Scroll Saw Blades.....	35¢
Scythe Snaths.....	
Scythe Snaths.....	50¢25¢
Shears—	
American (Cast) Iron.....	75¢10¢75¢10¢55¢
Pruning..... See Pruning Hooks and Shears	
Barnard's Lamp Trimmers.....	75¢10¢35¢
Tinners.....	30¢25¢
Seymour's, List, Dec., 1881.....	60¢10¢10¢50¢10¢10¢55¢
Heinrich's, List, Dec., 1881.....	60¢10¢10¢50¢10¢10¢55¢
Heinrich's Tailor's Shears.....	35¢
First quality C. S. Trimmers.....	80¢80¢10¢
Second quality C. S. Trimmers.....	80¢10¢80¢10¢10¢
Acme Cast Shears.....	10¢10¢
Diamond Cast Shears.....	10¢
Clippers.....	10¢10¢
Victor Cast Shears.....	75¢10¢75¢10¢55¢
Howe Bros. & Hulbert, Solid Forged Steel.....	40¢
Chicago Drop Forge & F. Co., Solid Steel Forged.....	70¢
Clausen Shear Co., Japanned.....	70¢
Clausen Shear Co., Nickel, same list.....	60¢
Sheaves—	
Sliding Door.....	50¢10¢50¢10¢55¢
M. W. Co., List July, 1888.....	55¢50¢
R. & E. list, Dec. 18, 1885.....	55¢50¢
Corbin's list.....	60¢10¢25¢
Patent Roller.....	60¢10¢25¢
Patent Roller, Hatfield's.....	70¢
Russell's Anti-Friction, list Dec., 1885.....	60¢25¢
Moore's Anti-Friction.....	50¢
Sliding Shutter.....	60¢10¢25¢
R. & E. list, Dec. 18, 1885.....	60¢10¢25¢
Sargent's list.....	60¢10¢
Reading list.....	60¢10¢10¢
Ship Tools—	
L. & I. J. White.....	30¢25¢
Alberson Mfg. Co.....	25¢
Shoes, Horse, Mule, &c.—	
Burden's, Perkins', Phoenix, at factory.....	\$4.00
Stone—	
Add \$1 7/8 kg to above prices.	
Or, Wrought—	
Ton lots.....	75¢ 2¢
1000 lb lots.....	75¢ 2¢
500 lb lots.....	75¢ 10¢
Shot—	
(Eastern prices 2¢ off, cash, 5 days.)	
Drop, 7 bag, 25 lb.....	\$1.20
Drop, 7 bag, 5 lb.....	.20
Back and Chilled, 7 bag, 25 lb.....	1.45
Back and Chilled, 7 bag, 5 lb.....	.34
Shovels and Spades—	
Ames' Shovels, Spades, &c., list Nov. 1, 1886.....	20¢
extra on above.....	50¢75¢
Griffith's Black Iron.....	50¢10¢
Griffith's C. S.....	60¢80¢10¢
Griffith's Solid C. S. E. R. Goods.....	20¢
Old Colony (Sanford Fork & Tool Co.).....	20¢
St. Louis Shovel Co.....	20¢20¢75¢
Hussey, Binns & Co.....	15¢25¢
Hubbard & Co.....	20¢20¢75¢
Lehigh Mfg. Co.....	50¢10¢
Payne Petroleum & Sons, list January, 1886.....	30¢
Remington's (Lowman's Patent).....	30¢10¢40¢
Rowland's, Black Iron.....	50¢10¢
Rowland's Steel.....	60¢25¢60¢10¢
Shovels and Tongs—	
Iron Head.....	60¢10¢60¢10¢55¢
Brass Head.....	60¢10¢10¢
Skins, Thimble—	
Western list.....	75¢55¢75¢10¢
Columbus V. Steel, list Nov. 1, 1887.....	30¢
Coldbrookdale Iron Co.....	50¢10¢
Utica P. S. T. Skins.....	60¢
Utica Turned and Fitted.....	35¢
Sieves—	
Buffalo Metallic, S. S. & Co.....	50¢25¢10¢
Barber Flour Sifters.....	75¢10¢
Smith's Adjustable Milk Strainer.....	75¢10¢
Smith's Adjustable Milk Strainer.....	75¢10¢
Smith's Adjustable T. & C. Strainer.....	75¢10¢
Staves, Wooden Rim—	
Mesh 18, Nested, 7 doz.....	70¢
Mesh 20, Nested, 7 doz.....	85¢
Mesh 24, Nested, 7 doz.....	1.00
Staves—	
School, by case.....	50¢10¢
Snaps, Harness, &c.—	
Anchor (T. & S. Mfg. Co.).....	65¢
Fitch's (Bristol).....	50¢10¢
Hutchins.....	10¢
Andrews.....	50¢
Sargent's Patent Guarded.....	70¢10¢10¢
German, new list.....	40¢10¢
Covert.....	50¢25¢
Covert, New Patent.....	60¢25¢
Covert, New R. E.....	60¢25¢
Covered Spring.....	60¢10¢10¢
Soldering Irons—	
Covert's Adjustable, list Jan. 1, 1886.....	35¢25¢
Spoke Shaves—	
Iron.....	45¢
Wood.....	40¢
Bailey's (Stanley R. & L. Co.).....	40¢10¢
Stearns.....	30¢10¢30¢
Spoke Trimmers—	
Bonney's.....	75¢10¢10¢, 50¢
Stearns.....	20¢10¢
Ives, No. 1, \$15.00; No. 2, \$12.00 7/8 doz.....	55¢10¢
Douglas.....	75¢10¢, 20¢
Spoons and Forks—	
Tinned Iron.....	70¢10¢
Basting, Cen. Stamp Co.'s list.....	70¢10¢
Solid Table and Tea, Cen. Stamp Co.'s list.....	70¢10¢
Buffalo S. S. & Co.....	35¢25¢
Silver-Plated—(4 mos. or 5¢ cash 30 days.)	
Meriden Brit. Co., Rogers.....	50¢
C. Rogers & Bros.....	50¢
Rogers & Bros.....	50¢
Reed & Barton.....	50¢
Wm. Rogers Mfg. Co.....	50¢10¢50¢
Simpson, Hall, Miller & Co.....	50¢10¢
Holmes & Edwards Silver Co.....	50¢10¢
H. & E. Silver Co., Mexican Silver.....	50¢10¢55¢
H. & E. Silver Co., Durham Silver.....	50¢10¢55¢
German Silver.....	50¢50¢55¢
German Silver, Hall & Elton.....	50¢55¢ cash
Nickel Silver.....	50¢55¢10¢55¢ cash
Britannia.....	60¢
Boardman's Flat Ware.....	50¢10¢
Boardman's Nickel Silver.....	50¢
Boardman's Britannia Spoons, case 100.....	60¢
Springs—	
Elliptic, Concord, Platform and Half Scroll.....	60¢60¢55¢
Cliff's Bolster Springs.....	25¢
Squares—	
Steel and Iron.....	75¢10¢80¢
Nickel-Plated.....	60¢10¢10¢70¢
Try Square and T Bevels.....	40¢10¢
Winterbottom's Try and Miter.....	30¢10¢
Starrett's Micrometer Calliper Squares.....	25¢
Avery's Flush Bevel Squares.....	30¢25¢
Staples—	
Fence Staples, Galvanized.....	Same price as B'W' Wire
Fence Staples, Plain.....	See Trd. Rep.
Steelyards.....	
40¢10¢60¢	
Stocks and Dies—	
Blacksmith's.....	30¢55¢30¢10¢
Waterford Goods.....	30¢55¢30¢10¢
Butterfield's Goods.....	25¢30¢
Lightning Screw Plate.....	35¢25¢40¢
Reece's New Screw Plates.....	35¢25¢40¢
Stone—	
Hindustan No. 1, 3¢; Axa, 3¢; Slips No. 1, 4¢	
Sand Stone.....	75¢ 2¢
Washita Stone, Extra.....	10¢25¢
Washita Stone, No. 1.....	14¢15¢
Washita Stone, No. 2.....	10¢11¢
Washita Slips, No. 1, Extra.....	30¢35¢
Washita Slips, No. 1.....	24¢25¢
Arkansas Stone, No. 1, 4 to 6 in.....	\$1.50
Arkansas Stone, No. 1, 6 to 9 in.....	\$1.85
Turkey Oil Stone, 4 to 8 in.....	75¢ 40¢
Turkey Slips.....	\$1.00 15¢
Lake Superior, Chase.....	15¢
Lake Superior Slips, Chase.....	31¢32¢
Seneca Stone, Red Paper Brand.....	15¢
Seneca Stone, High Rounds.....	15¢20¢
Seneca Stone, Small Whets.....	20¢40¢
Stone Polish—	
Joseph Dixon's.....	75¢10¢, dis 10¢
Gold Medal.....	75¢10¢, dis 10¢
Mirror.....	75¢10¢, dis 10¢
Lustro.....	75¢10¢, dis 10¢
Ruby.....	75¢10¢, dis 10¢
Rising Sun, 5 gro lots.....	75¢10¢, dis 10¢
Dixon's Plumbago.....	75¢10¢, dis 10¢
Boydton's Noon Day.....	75¢10¢, dis 10¢
Easton's Pride Stone Enamel.....	75¢10¢, dis 10¢
Vates' Liquid.....	75¢10¢, dis 10¢
Yates Standard Paste Polish, 10 lb cans.....	75¢10¢, dis 10¢
Jet Black.....	75¢10¢, dis 10¢
Japanese.....	75¢10¢, dis 10¢
Firestone.....	75¢10¢, dis 10¢
Diamond O. E. Enamel.....	75¢10¢, dis 10¢
Bonnell's Liquid Stove Polish.....	75¢10¢, dis 10¢
Bonnell's Paste Stove Polish.....	75¢10¢, dis 10¢
Black Eagle Benzine Paste, 5 and 10 lb cans.....	75¢10¢, dis 10¢
Black Jack Water Paste, 5 and 10 lb cans.....	75¢10¢, dis 10¢
Nickel Plate Paste.....	75¢10¢, dis 10¢
Tacks, Brads, &c.—	
List, Jan. 2, 1888. (Note.—Some manufacturers are selling Tacks at slightly higher prices than those named.)	
American Iron Carpet.....	80¢80¢55¢
Sweden Iron Carpet.....	80¢80¢55¢
American Iron Cut.....	75¢75¢10¢
Sweden Iron.....	75¢75¢10¢
Sweden Iron, Upholsterers.....	75¢10¢75¢10¢55¢
Tinned Sweden Iron.....	75¢10¢75¢10¢55¢
Tinned Sweden Iron, Upholsterers.....	75¢10¢75¢10¢55¢
Gimp and Lace.....	75¢10¢75¢10¢55¢
Tinned Gimp and Lace.....	75¢10¢75¢10¢55¢
Sweden Iron Trimmers.....	75¢10¢75¢10¢55¢
Sweden Iron Miners.....	75¢10¢75¢10¢55¢
Sweden Iron Bill Posters or Railroad.....	75¢10¢75¢10¢55¢
Sweden Steel (Sweden Iron price list).....	80¢80¢55¢
Copper Tacks.....	50¢10¢
Copper Finishing, Trunk and Clout Nails.....	50¢10¢
Finishing Nails.....	70¢10¢70¢10¢10¢
Trunk and Clout Nails.....	70¢10¢70¢10¢10¢
Tinned Trunk and Clout Nails.....	70¢10¢70¢10¢10¢
Basket Nails.....	70¢10¢70¢10¢10¢
Common and Patent Brads, 70¢10¢70¢10¢10¢	
Hungarian Nails.....	70¢10¢70¢10¢10¢
Chair Nails.....	70¢10¢70¢10¢10¢
Zinc Glaziers' Points.....	50¢50¢55¢
Cigar Box Nails.....	50¢10¢50¢10¢55¢
Picture-Frame Points.....	50¢10¢50¢10¢55¢
Looking-Glass Tacks.....	50¢10¢50¢10¢55¢
Leathered Carpet.....	50¢10¢50¢10¢55¢
Brush Tacks.....	50¢10¢50¢10¢55¢
Shoe Finders, List Jan. 2, 1888.....	10¢10¢55¢
Lining and Saddle Nails, List Jan. 1, 1888.....	30¢10¢10¢
Silvered.....	30¢10¢10¢
Japanned.....	20¢10¢10¢
Double Pointed Tacks.....	35¢
Wire Carpet Nails.....	50¢10¢
Wire Brads & Nails, see Nails, Wire.....	50¢10¢
Steel-Wire Brads, K. & E. Mfg. Co.'s list.....	60¢10¢
Tap Borers—	
Common and Rind.....	20¢10¢
Ive's Tap Borer.....	33¢45¢
Enterprise Mfg. Co.....	30¢10¢30¢
Clark's.....	33¢45¢
Tapes, Measuring—	
American.....	25¢10¢
Spring.....	40¢
Chesterman's, Regular list.....	25¢30¢
Thermometers—	
Tin Case.....	80¢80¢10¢
Thimble Skeins—See Skeins.	
Ties, Bale-Steel	
Standard Wire, list.....	50¢10¢55¢
Tinners' Shears, &c.—	
Shears and Snips (P. S. & W.).....	20¢25¢
Punches, see Punches.....	
Snips, J. Mallinson & Co.....	33¢45¢
Tinware—	
Stamped, Japanned and Plated, list Jan. 20, 1887.....	75¢75¢55¢
Tire Benders, Upsetters, &c.—	
Stoddard's Lightning Tire Upsetters.....	15¢
Detroit Perfected Tire Bender.....	15¢
Tobacco Cutters—	
Champion.....	30¢10¢30¢
Wood Bottom.....	75¢10¢55¢25¢
All Iron.....	75¢10¢55¢25¢
Nashua Lock Co.'s.....	75¢10¢55¢25¢
Wilson's.....	75¢10¢55¢25¢
Sargent's.....	75¢10¢55¢25¢
Acme.....	75¢10¢55¢25¢
Transom Lifters—	
Wollensak's.....	50¢
Class 8 and 4, Bronzed Iron.....	50¢
Class 3 and 4, Bronze Metal.....	25¢
Class 3 and 4, Brass.....	35¢
Skylight Lifters.....	35¢
Crown, Eagle and Shield.....	50¢
Reiher's.....	50¢
Bronzed Iron Rods, list Jan. 1, 1887.....	50¢25¢
Steel Base or Nickel Plate.....	50¢25¢
Excelstor.....	50¢10¢25¢
Shaw's.....	50¢10¢25¢
Payson's Universal.....	40¢40¢10¢
Traps—	
Game.....	35¢40¢25¢
Newhouse.....	35¢40¢25¢
Oneida Pattern.....	70¢70¢25¢
Game, Blake's Patent.....	40¢10¢25¢
Mouse and Rat—	
Mouse Wood, Choker.....	11¢12¢
Mouse, Round Wire.....	75¢10¢, 10¢
Mouse, Cage Wire.....	75¢10¢, 10¢
Mouse, Catch-'em-alive.....	75¢10¢, 10¢
Mouse, "Bonanza".....	75¢10¢, 10¢
Mouse Delusion.....	75¢10¢, 10¢
Rat, "Decoy".....	75¢10¢, 10¢
Ideal.....	75¢10¢, 10¢
Cyclone.....	75¢10¢, 10¢
Kitchins Metallic Mouse, 5-hole traps.....	75¢10¢, 10¢
In full cases.....	75¢10¢, 10¢
Trowels—	
Lothrop's Brick and Plastering.....	25¢
Reed's Brick and Plastering.....	15¢
Dixon's Br'k and Plastering.....	25¢25¢10¢
Peace's Plastering.....	25¢
Clement & Maynard's.....	20¢
Rose's Brick.....	15¢20¢
Brade's Brick.....	25¢
Verwall's Brick and Plastering.....	30¢
Garden.....	70¢
Triers—	
Butter and cheese.....	25¢
Trucks, Warehouse, &c.—	
B. & L. Block Co.'s list.....	72..... 40¢
Tubes, Boiler—	
See Pipe.....	
Twine—	
Flax Twine.....	BC. B.
No. 9, 1/4 and 1/2 B Balls.....	22¢ 30¢
No. 12, 1/4 and 1/2 B Balls.....	21¢ 29¢
No. 18, 1/4 and 1/2 B Balls.....	18¢ 28¢
No. 24, 1/4 and 1/2 B Balls.....	18¢ 28¢
No. 36, 1/4 and 1/2 B Balls.....	16¢ 27¢
No. 36, 1/4 and 1/2 B Balls.....	16¢ 27¢
Chalk Line, Cotton, 1/4 B Balls.....	48¢50¢
Mason Line, Cotton, 1/4 B Balls.....	55¢
2-Ply Hemp, 1/4 and 1/2 B Balls (Spring Twine).....	11¢
3-Ply Hemp, 1/4 B Balls.....	12¢12¢4¢
3-Ply Hemp, 1/4 B Balls.....	11¢11¢4¢
Cotton Wrapping, 5 Balls to lb.....	15¢16¢
2, 3, 4 and 5-Ply Jute, 1/4 B Balls.....	10¢
Wool and 5-Ply Jute, 1/4 B Balls.....	6¢6¢4¢
Paper.....	11¢11¢4¢
Cotton Mops, 6, 9, 12 and 15 lb to doz.....	18¢
Vises—	
Solid Box.....	60¢60¢25¢
Parallel.....	
Fisher & Norris Double Screw.....	15¢10¢
Stephens.....	25¢30¢
Parker's.....	
Wilson's.....	20¢25¢
Howard's.....	55¢
Bonney's.....	40¢
Millers Falls.....	40¢10¢
Trenton.....	40¢55¢40¢10¢
Merrill's.....	15¢30¢
Sargent's.....	60¢10¢10¢
Backus and Union.....	40¢
Double Screw Leg.....	15¢10¢
Prentiss.....	30¢55¢25¢
Simpson's Adjustable.....	40¢
Moore's.....	30¢
Saw Vises—	
Bonney's, Nos. 2 & 3, \$15.00.....	40¢10¢
Stearns.....	33¢45¢10¢10¢55¢
Stearns' Silent Saw Vises.....	33¢45¢35¢
Sargent's.....	60¢10¢
Hopkins.....	75¢10¢, 10¢
Reading.....	40¢10¢
Wentworth.....	20¢10¢
Combination Hand Vises.....	75¢10¢, 10¢
Correll Hand Vises.....	20¢
Bauer's Pipe Vises.....	10¢
Wagon Boxes—	
Per B.....	2¢4¢
Wagon Jacks—	
Daisy.....	75¢10¢, 25¢
Washer Cutters—	
Smith's Pat.....	75¢10¢, 20¢10¢10

CURRENT METAL PRICES.

MARCH 6, 1889.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market reports.

IRON AND STEEL.			
Bar Iron from Store.			
Common Iron:			
1/2 to 2 in. round and square.	{	per lb	1.90 @ ...
1 to 6 in. x 3/4 to 1 in.	...		
Refined Iron:			
1/2 to 2 in. round and square.	{	per lb	2.00 @ 2.10
1 to 4 in. x 3/4 to 1 1/4 in.	...		
4 1/2 to 6 in. x 3/4 to 1 in.	...		
1 to 6 in. x 1/4 and 5-16	...	per lb	2.30 @ 2.30
Rods—1/2 and 11-16 round and sq.	...	per lb	2.10 @ 2.20
Bands—1 to 6 x 3-16 to No. 12.	...	per lb	2.20 @ 2.30
"Burden Best" Iron, base price.	...	per lb	3.00 @ ...
Burden's "H. B. & S." Iron, base price.	...	per lb	2.80 @ ...
"Ulster"	...	per lb	3.10 @ ...
Norway Rods	...	per lb	4.00 @ 5.00
Merchant Steel from Store.			
Open-Hearth and Bessemer Machinery, Tce Calk, Tire and Sleigh Shoe, base price in small lots.			2 1/4
Best Cast Steel, base price in small lots.			2 1/4
Best Cast Steel Machinery, base price in small lots.			5
Sheet Iron from Store.			
Common American.		R. G. Cleaned.	
10 to 16.	per lb	2.75 @ 2.80	3.35 @ ...
17 to 24.	per lb	2.85 @ 3.00	3.25 @ 3.50
25 to 30.	per lb	3.00 @ 3.10	3.50 @ ...
31 to 34.	per lb	3.20 @ 3.30	3.50 @ ...
35 and 36.	per lb	3.30 @ 3.37 1/2	3.75 @ ...
37.	per lb	3.35 @ 3.40	3.75 @ ...
38.	per lb	3.50 @ 3.55	4.00 @ ...
B. B.			3d qual.
Galv'd, 14 to 20.	per lb	4.50 @ 4.58	4.28 @ ...
Galv'd, 21 to 24.	per lb	4.57 1/2 @ 4.75	4.75 @ ...
Galv'd, 25 to 28.	per lb	5.25 @ 5.12	5.12 @ ...
Galv'd, 29.	per lb	5.62 1/2 @ 5.48	5.48 @ ...
Galv'd, 30.	per lb	6.00 @ 5.85	5.85 @ ...
Patent Planchet.	per lb	10 1/4 @ 10.9	10.9 @ ...
Russia.	per lb	9 1/4 @ 9.75	9.75 @ ...
American Cold Rolled B. B.	per lb	5 1/2 @ 5.75	5.75 @ ...
English Steel from Store.			
Best Cast.	per lb	15 @ 16 1/2	16 1/2 @ ...
Extra Cast.	per lb	16 1/2 @ 17	17 @ ...
Swaged Cast.	per lb	16 @ 16 1/2	16 1/2 @ ...
Best Double Shear.	per lb	15 @ 16 1/2	16 1/2 @ ...
Best, 1st quality.	per lb	12 1/4 @ 12 3/4	12 3/4 @ ...
German Steel, Best.	per lb	10 @ 10 1/2	10 1/2 @ ...
2d quality.	per lb	9 @ 9 1/2	9 1/2 @ ...
3d quality.	per lb	8 @ 8 1/2	8 1/2 @ ...
Sheet Cast Steel, 1st quality.	per lb	15 @ 15 1/2	15 1/2 @ ...
2d quality.	per lb	14 @ 14 1/2	14 1/2 @ ...
3d quality.	per lb	12 1/4 @ 12 3/4	12 3/4 @ ...
METALS.			
Tin.			
Sanca, Pigs.	per lb	23 1/4 @ 23 1/2	23 1/2 @ ...
Straits, Pigs.	per lb	23 @ 23 1/4	23 1/4 @ ...
English, Pigs.	per lb	23 1/4 @ 23 1/2	23 1/2 @ ...
Straits in Bars.	per lb	24 @ 24 1/2	24 1/2 @ ...
Tin Plates.			
Charcoal Plates.—Bright.			Per box
Melny Grade.	IC, 10 x 14.	\$5.75	@ \$6.00
"	IC, 12 x 12.	6.00	@ 6.25
"	IC, 14 x 20.	5.75	@ 6.00
"	IC, 20 x 28.	12.00	@ 12.50
"	IX, 10 x 14.	7.25	@ 7.50
"	IX, 12 x 12.	7.50	@ 7.75
"	IX, 14 x 20.	7.25	@ 7.50
"	IX, 20 x 28.	15.00	@ 15.50
"	DC, 12 1/2 x 17.	5.50	@ 5.75
"	DX, 12 1/2 x 17.	7.00	@ 7.25
Call and Grade.	IC, 10 x 14.	5.75	@ 6.00
"	IC, 12 x 12.	6.00	@ 6.25
"	IC, 14 x 20.	5.75	@ 6.00
"	IX, 10 x 14.	7.25	@ 7.50
"	IX, 12 x 12.	7.50	@ 7.75
"	IX, 14 x 20.	7.25	@ 7.50
Allaway Grade.	IC, 10 x 14.	5.00	@ 5.12 1/2
"	IC, 12 x 12.	5.12 1/2	@ 5.25
"	IC, 14 x 20.	5.00	@ 5.12 1/2
"	IC, 20 x 28.	11.00	@ 11.25
"	IX, 10 x 14.	6.00	@ 6.25
"	IX, 12 x 12.	6.25	@ 6.50
"	IX, 14 x 20.	6.00	@ 6.25
"	IX, 20 x 28.	12.00	@ 12.50
"	DC, 12 1/2 x 17.	4.75	@ 5.00
"	DX, 12 1/2 x 17.	5.75	@ 6.00
Coke Plates.—Bright.			
Steel Coke.—IC, 10 x 14, 14 x 20.		\$4.75	@ \$5.00
"	10 x 20.	7.25	@ 7.50
"	20 x 28.	9.75	@ 10.25
"	IX, 10 x 14, 14 x 20.	5.50	@ 5.75
BV Grade.—IC, 10 x 14, 14 x 20.		4.40	@ 4.60
Charcoal Plates.—Tern.			
Dean Grade.—IC, 14 x 20.		\$4.40	@ \$4.60
"	20 x 28.	9.00	@ 9.25
"	IX, 14 x 20.	4.40	@ 4.60
"	20 x 28.	11.00	@ 11.25
Abecarnae Grade.—IC, 14 x 20.		4.25	@ 4.50
"	20 x 28.	8.50	@ 9.00
"	IX, 14 x 20.	5.25	@ 5.50
"	20 x 28.	10.50	@ 10.80
Tin Boiler Plates.			
IXX, 14 x 26.	112 sheets	\$12.50 @	\$12.50 @
IXX, 14 x 28.	112 sheets	12 75 @	12 75 @
IXX, 14 x 31.	112 sheets	14 25 @	14 25 @
Copper.			
DUTY: Pig. Bar and Ingot, 4c: Old Copper, 3d.			
Manufactured (including all articles which Copper is a component of chief value)			
45 s, ad valorem			
Ingot.			
Lake.		16 1/2 @	17 1/2 @
"Anchor" Brand.			

THE IRON AGE

THURSDAY, MARCH 14, 1889.

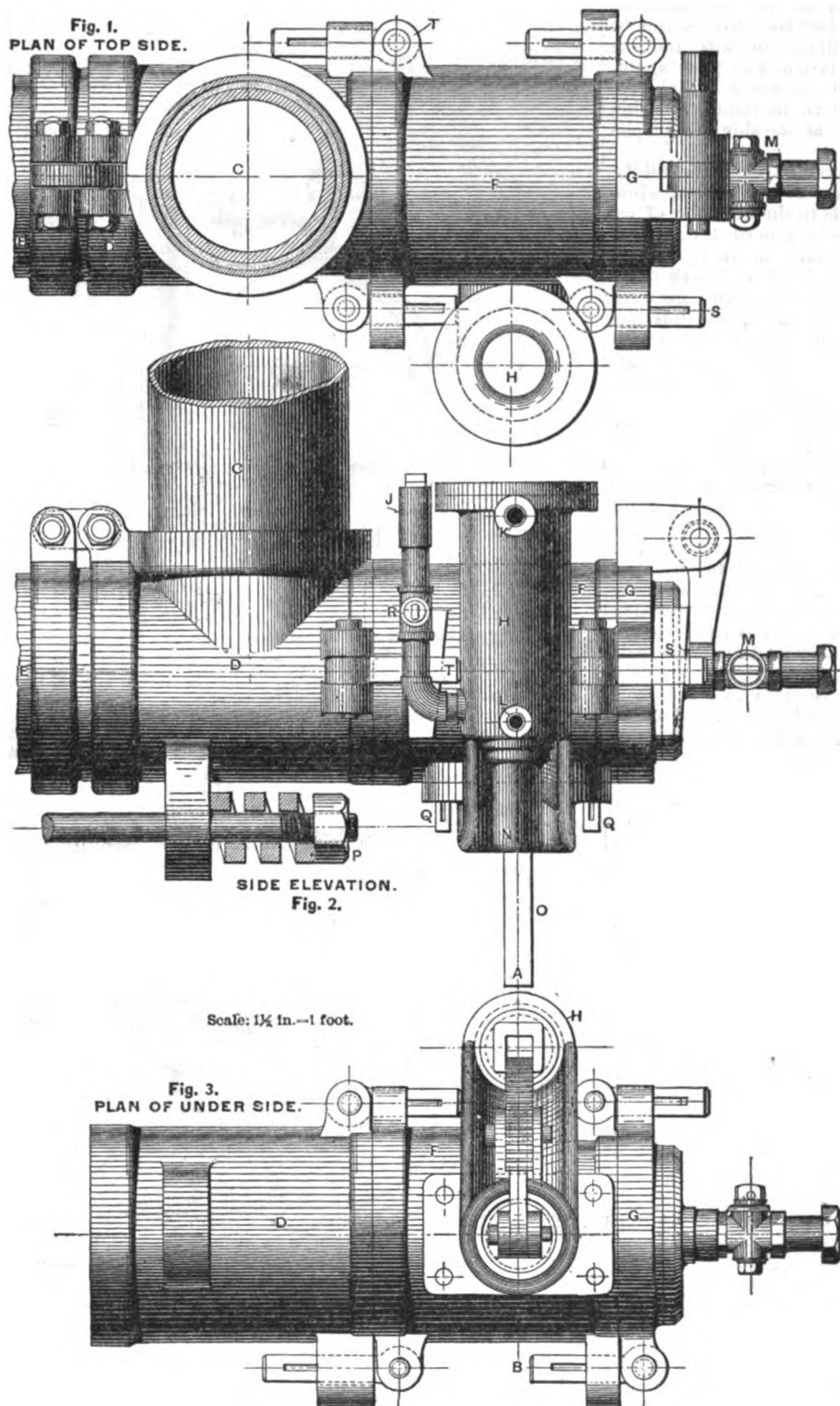
Tuyere Slagging-Valve.*

BY EDGAR S. COOK, POTTSTOWN, PA.

For several years past, dating particularly from the days of serious "ore-dirt" complications at the Warwick Furnace, I

the crucible, or when, from dropping or jumping of stock, the molten slag is forcibly driven into the belly and leg pipes. Various methods were proposed, but objections of one kind or another always presented themselves, and the subject was postponed to a more convenient season.

jacket at one side of the bottom of the water-blocks were found to be of no value whatever. The swinging or hinged cap on the elbow of the belly-pipe, while convenient to permit the removal of slag after the belly-pipe was partially or wholly filled, could not be adapted to discharge



THREE-INCH TUYERE SLAGGING-VALVE, IN USE AT THE WARWICK FURNACE, POTTSTOWN, PA.

have been desirous of providing some safe, quick and easy method of relieving the tuyeres of slag, when the cinder and iron notches are chilled through loss of heat in

* Read at the Buffalo meeting of the American Institute of Mining Engineers.

In the summer of 1887, while running on anthracite alone, I found the various expedients in use to be so utterly valueless that the importance of a practical tuyere slagging-valve impressed me more forcibly than ever. The holes left in the cast-iron

the slag before solidifying, except at great risk to the men and loss of time just when the constant running of the engine and the keeping of blast on the furnace was of the utmost importance. By removing keys from the caps and holding them in place

with props, the slag could be discharged through the tuyeres and belly-pipes, with the engine running, by knocking the props away at a given signal. This method is extremely hazardous to life and limb, and I have always hesitated to make use of it. When the furnace is in such a condition as to require the adoption of some method of the kind, the stoppage of the engine, cooling the blast and the contents of the crucible, always aggravates the trouble. When the caps are blown open and the slag is discharged by removal of the props it is necessary to stop the engine to replace them. An hour or more will elapse before this can be done, as the slag must be partly removed before the tuyeres can be approached by ordinary mortals, and the caps handled and fastened in place again. Any movement of the stock is liable to burn the workman as he stands securing the cap in front or at one side of the open belly-pipe.

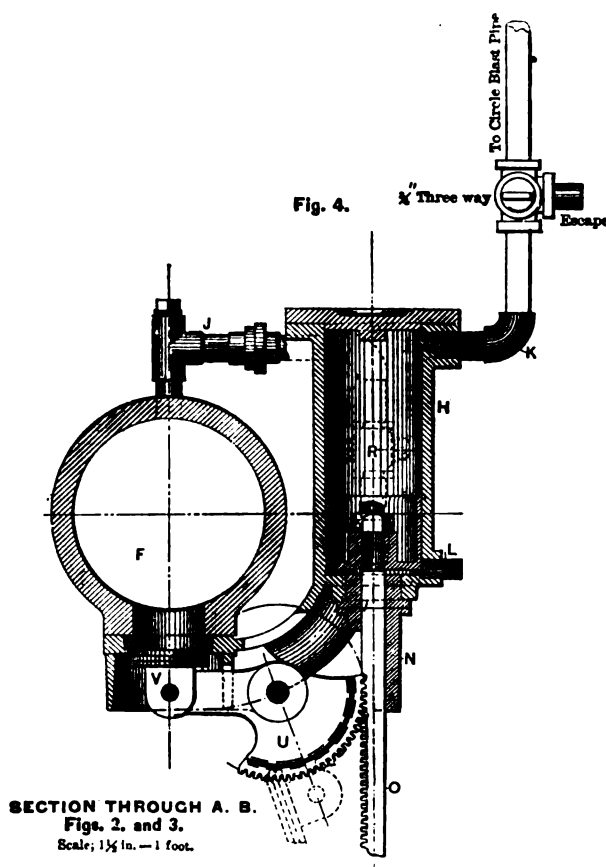
The cooling of crucible contents and the lowering of the heat of the stoves, while thus standing, adds to the difficulty of restoring the furnace to a normal condition and renders necessary a resort to this method a second, third or fourth time, and even oftener, the conditions growing more unfavorable each hour, and thus frequently causes the loss of the furnace which could have been prevented from chilling, while the work was made safe to all engaged, if there had been a quick, easy method of removing the slag through the tuyeres and belly-pipes, without loss of time or heat. We attempted in 1887 to use the method just described, but our belly-pipes filled solid with slag before we could get props in place, the change in the furnace coming unexpectedly and quickly. Several hours were required to clean the pipes. Fortunately, the trouble was only temporary. On starting up again the slag cleared the tuyeres and ran from an enlarged cinder notch without further serious trouble.

This experience brought into existence the tuyere slagging-valve now in use at the Warwick Furnace, and found to be valuable in more ways than one. Our chief engineer suggested that a valve placed in the cap or bottom of the belly-pipe, connected with the piston of a cylinder of larger diameter than the valve and operated with a three-way cock placed in a pipe connecting the cylinder with the main blast-pipe, would afford a safe and sure way of flushing through any belly-pipe without stopping the engine at all. The three-way cock he proposed so to locate at a convenient position that the slag discharged would not interfere with the man operating it. The idea seemed feasible, and orders were given to have one constructed and put into position. The trial of the first valve completed was so satisfactory that we arranged to put similar valves on all our tuyeres, improving the mechanical construction and convenience of the device as we progressed. The accompanying drawings will explain the construction. Figs. 1, 2, 3 and 4 represent the ordinary 3-inch valve.

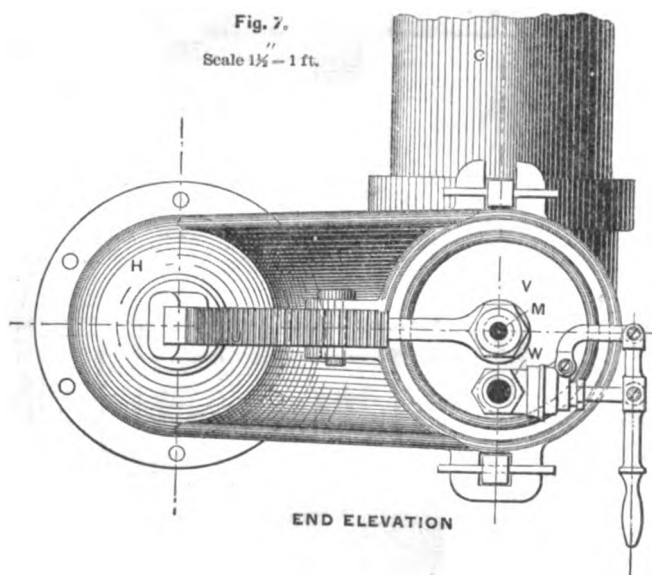
In these figures, C is the leg-pipe; D, the elbow; E, the belly-pipe; F, the circular casting, keyed to elbow by keys T. This casting carries the valve-seat, held in position by keys Q, and is of the same diameter, external and internal, D, as the elbow. G is the swinging cap of the elbow, held in position by keys S. H is the valve-cylinder, with K opening for connecting pipe running to the circular blast-pipe and a small opening, L, at bottom for the escape to the atmosphere of any air leaking past the piston. M is the usual eye-hole, arranged with a stop-cock to permit the easy cleaning of the glass. N is the guide for the rack-extension, O, of the piston-rod; U, the sector with extended arm, carrying the valve V, and fitted to work easily with rack O. In practice, we found that when

the valve V was thrown open by pressure of air in the belly-pipe (the pressure in valve-cylinder being cut off) owing to its own weight and that of piston and piston-rod, V would partially close again, not enough to interfere with the flow of slag through the opening, but just enough for the slag to strike it and in time cut it. In

the valve V wide open and hold it in the position shown. In pipe J is placed a stop-cock, R, to regulate the amount of air to be admitted to the lower side of the piston. A brass plug, X, is screwed into top of the tee, to facilitate the cleaning of the pipe should it become filled with plumbago or gas-dirt. The



THREE-INCH TUYERE SLAGGING-VALVE.



SIX-INCH TUYERE SLAGGING-VALVE

order to hold the open valve in the position shown in Fig. 4, a 4-inch pipe-connection, J, was made from the top of the circular casting, F, to the lower part of the valve-cylinder H. The opening in the cylinder is immediately opposite the piston when the valve is closed. When the valve V is opened and the piston of the cylinder raises, air passes through pipe J to the lower side of the piston and assists to throw

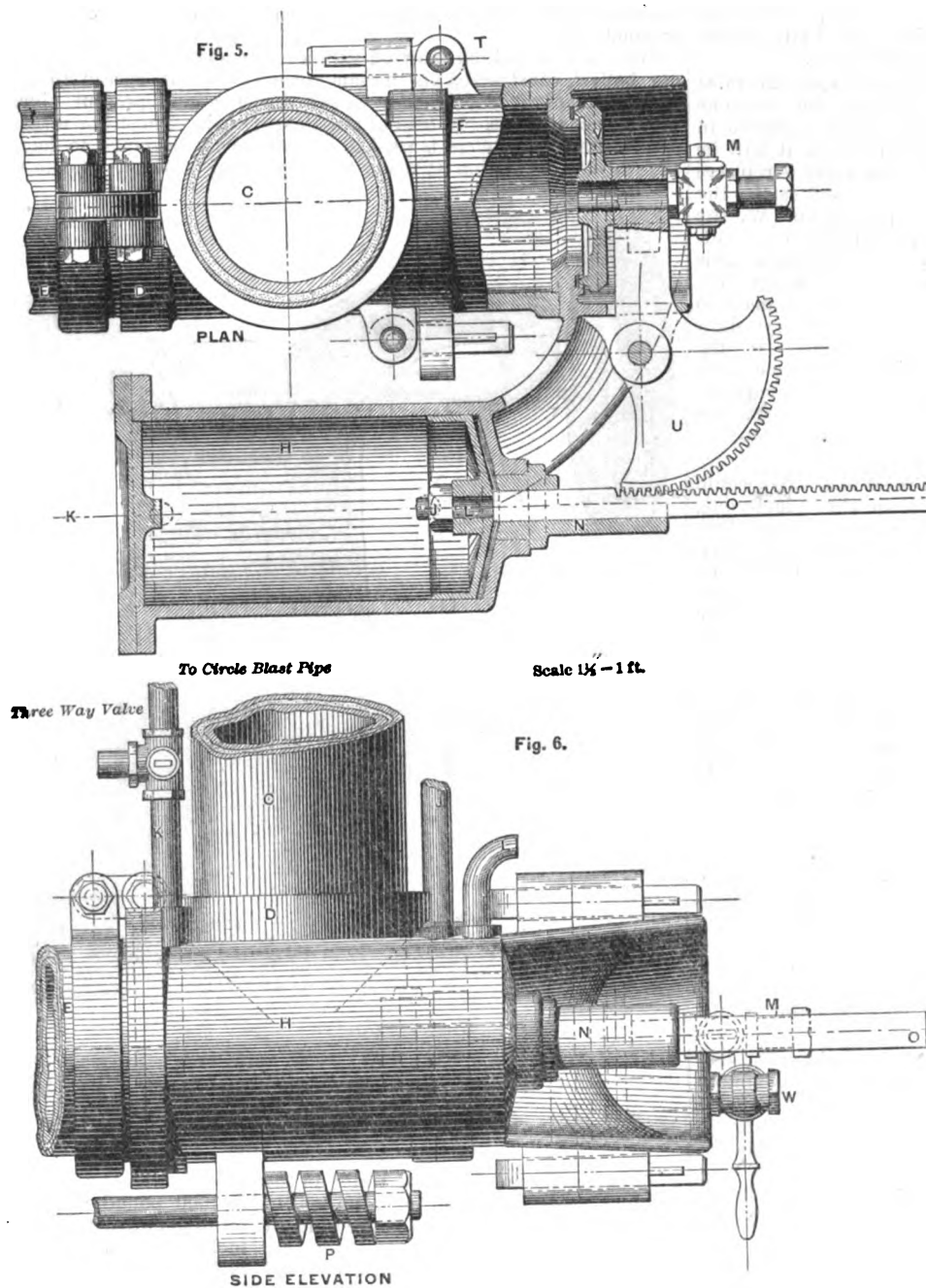
tuyere slagging-valve is easily applied to any of the usual forms of belly-pipes. The connection between it and the main blast-pipe can be made by any one accustomed to put up gas or steam pipe. One main pipe, 1 1/2 inches in diameter, is connected with the main blast or bustle pipe, and from this 4-inch branches are run to the several tuyeres, one to each tuyere-arch. A 1 1/2-inch three-way cock is

placed in the $1\frac{1}{4}$ -inch pipe and $\frac{3}{4}$ -inch three-way cocks in each of the branches, located as may be found most convenient. The $\frac{3}{4}$ -inch pipe of each tuyere-arch is connected by means of a brass union with the top of the valve-cylinder. To keep the valve closed, the furnace being in operation, the plug of the $1\frac{1}{4}$ -inch three-way cock is so turned that the opening to the atmosphere is closed and the passage from main blast-pipe to branches and cylinders is opened. The $\frac{3}{4}$ -inch cocks are turned

valve the plug of the $\frac{3}{4}$ -inch three-way cock is turned in the opposite direction, closing the passage to the atmosphere and opening communication with the blast-pipe, the pressure from which, acting on the piston of the cylinder, overcomes the resistance of the air in the belly-pipe and closes the valve. By operating the $1\frac{1}{4}$ -inch three-way cock, all of the valves in use, one or six, can be opened instantaneously; or each valve can be used separately by operating the corresponding $\frac{3}{4}$ -

for a moment, thus avoiding all loss of time and all the dangers attending the further cooling off of crucible and blast. The management of a furnace is thus, to some extent, simplified, and one of the most serious annoyances attending the operation of an anthracite furnace is removed—viz., the difficulty of keeping the tuyeres open.

Flushing can be done through the tuyere slugging-valves with the same facility as through the cinder-notch. occasionally



PLAN AND SIDE ELEVATION OF SIX-INCH TUYERE SLUGGING-VALVE.

the same way. The pressure of blast in the belly-pipe is the same as in the valve-cylinder. The area of the piston being larger than the area of the valve in the belly-pipe, the latter is kept tightly closed, never leaking. If it is desired to open a valve, the plug of a $\frac{3}{4}$ -inch three-way cock is turned, cutting off the supply of air from the blast-pipe and opening its passage to the atmosphere. The pressure of blast in the belly-pipe acting upon the valve forces it open, driving up the piston of the valve-cylinder, upon which there is now no pressure. The air filling the cylinders escapes to the atmosphere through the side opening of the cock. To close the

inch three-way cocks. Slag driven into the belly-pipes by the jumping of the stock when the working of the furnace is temporarily deranged can be quickly and easily discharged through one or more of the slugging-valves, without loss of time or any inconvenience whatever. When the crucible is badly chilled the iron and cinder notches are closed and the slag melted by each tuyere is prevented from distributing itself over the area of the crucible, and confined to the immediate vicinity of the tuyere melting it. This slag can be discharged through the tuyere slugging-valves with no risk to the men and without stopping the engine

happens, even in a furnace working well, that a pocket forms under or around a certain tuyere, so that when the engine is stopped this tuyere is sure to fill with slag. When this condition is known to exist, it is only necessary to throw the blast off the furnace, open the valve of the tuyere, put blast on again, blowing slag out, and then stop the engine.

In addition to the uses mentioned, we have found that the tuyere slugging-valves supersede the "pricking" of the tuyeres, and answer the purpose far better. A pricking-rod is now used only when a large hard lump obstructs the nose of a tuyere, which rarely happens. In order

to keep the valves in good working order, it was our custom to open them regularly once or twice per turn. In so doing, we noticed that the tuyeres kept cleaner and brighter than heretofore. Indeed, we never had such uniformly bright and clean tuyeres, under all conditions of working, as we have had since using these valves—some nine months or more. Besides, we never before made so much iron in the same time. A clean, bright tuyere will certainly melt more material per hour than one furred with dirt. The frequent opening of the slagging-valves removes the dirt deposited in the belly-pipes from the gas and the infusible dirt that collects around the nose of each tuyere.

We have found a 3-inch valve the most convenient in size, although we have one 6 inches in diameter. This is shown in Figs. 5, 6 and 7, from which it will be seen that in this form the valve V replaces the ordinary swinging cap, and carries the eye-hole M and the pricker-hole W, the latter being closed by means of a full-way valve, instead of lever and ball. This valve is located on the front tuyere, directly over the iron-notch, and is made to replace the ordinary cap, the eye-sight and pricking-rod holes being in the valve. It can be easily opened to change nozzles. It is safer to operate a valve of this size independently of the others. Its cylinder is connected to the blast-pipe by a separate 1-inch pipe.

We consider that the 6-inch valve would be of more value than the 3-inch one, chiefly in extreme instances of the chilling of the crucible and a large accumulation of dry ore-dirt in the furnace. As now constructed, the 3-inch tuyere slagging-valve can be placed in position in about five minutes, everything being got ready before the stoppage of the furnace after a cast. A circular casting, about 11 inches long, of the same internal and external diameter as the elbow casting of the belly-pipe, is keyed to the elbow in place of the cap, the cap being transferred to the opposite end of the valve-casting. In other words, the ordinary elbow is lengthened by a separate casting 11 inches long. The air-cylinder is permanently attached to this circular casting, carrying the sector and the rack-extension of the piston-rod operating the valve, the valve itself being on the lower side of the casting. The seat of the valve is made detachable, so that it can be renewed should it become worn or cut by the action of the slag.

Recently we allowed considerable slag to accumulate in the furnace. By simply operating the three-way cock of the 6-inch slagging-valve, we flushed through the belly-pipe and valve without any injury either to the pipe or valve. A very slight shell of chilled slag remained in the pipe. The valve was closed easily and tightly by reversing the cock.

On another occasion, shortly before the regular time for flushing, the engine suddenly stopped, in spite of the efforts of the engineer to keep it moving. A joint in the steam-pipe had been remade earlier in the day, and we suppose a chip of wood had somehow got into the pipe and caught on the seat of one of the valves of the engine, thus causing its sudden stoppage. The furnace being full of slag, all the belly-pipes, as the engine stopped without warning, filled immediately. The 6-inch slagging-valve opened automatically from the pressure of the slag in the pipe, draining itself and also the adjoining pipe, the only one on which we had not placed a slagging-valve. The 8-inch valves were opened as quickly as possible by the keeper, by means of a small bar, no air-pressure being in the pipes. From each the slag flowed without difficulty. The delay in opening the 3-inch valves caused a more or less heavy shell to form in the

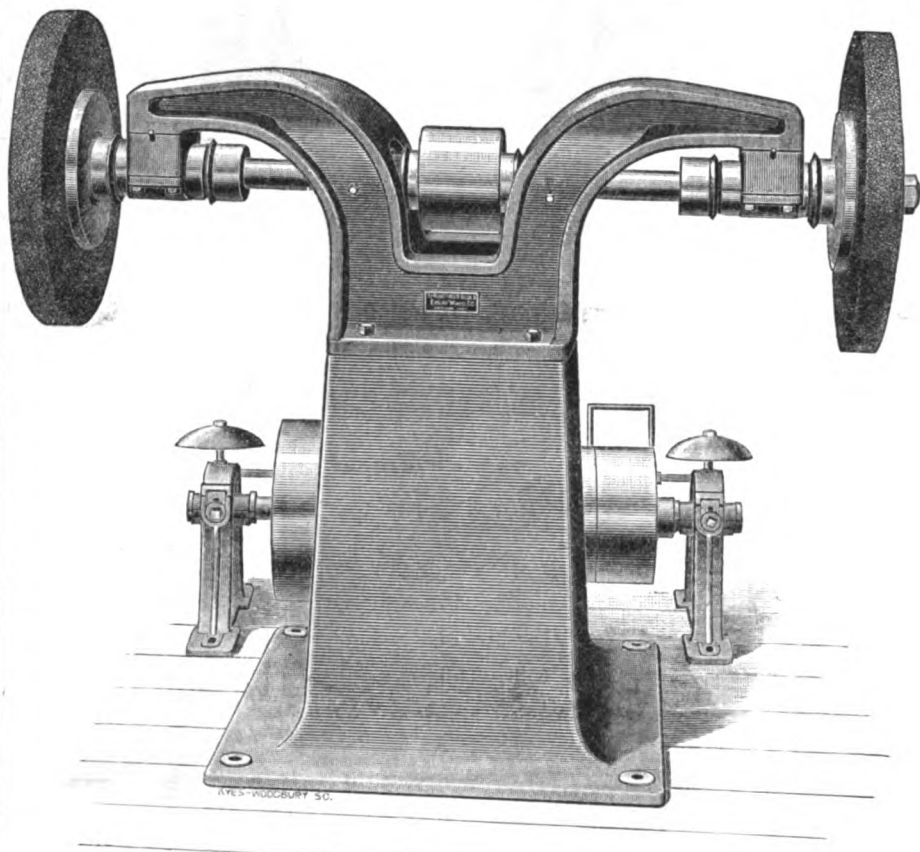
pipes, in contrast with the 6-inch valve, which opened of itself and left but a light shell in its belly-pipe. In half an hour's time all the pipes were perfectly cleaned and we started up again. But for the slagging-valves the pipes would all have been completely filled with slag, which would have solidified before it would have been possible to remove it by means of the ordinary swinging caps, thus entailing a stoppage of four or five hours. Such a long stoppage, coming unexpectedly, might, under some conditions, cause much trouble and additional expense. We think the valves have already repaid us to their original cost.

We are now making blow-off valves for our boilers, constructed on the same principle, with slight modifications to suit the different conditions. Instead of air, steam direct from the boilers is used to operate the valves. Provision is made to guard

length over all is 430 feet, beam 45 feet and depth of hold 30 feet 6 inches. Although her net tonnage is 3046 and gross tonnage 4649, she will carry 8000 tons of cargo. By a system of water ballast, after her cargo is discharged, she can take in 1000 tons in her tanks in a very short time and go to sea.

Heavy Plowshare Grinder.

This machine is especially adapted for grinding and polishing plows and other castings that are so heavy that it is necessary to handle them on a truck. It is made with a very heavy square base with sufficient spread to stand firmly on the floor and prevent vibration when being used. The arbor is made long, giving a good clearance to handle work. It has four bearings, so as to run steady without



HEAVY PLOWSHARE GRINDER.

against the accumulation of water in the cylinder condensed from the steam and to avoid the possibility of the freezing of any of the parts in extreme cold weather. Letters patent have recently been obtained for the tuyere slagging-valve device.

The new White Star freight steamships Runic and Cufic, recently put on the line between New York and Liverpool, were built strictly for the transportation of merchandise, and are navigated with such economy of fuel and low costs in other respects that they naturally come in sharp competition with rival lines. The Runic has a straight stem, iron hull, iron decks and four iron masts, with yards on the foremast. The other three masts are fitted with four stout booms apiece, fitted into goosenecks, so that when "peaked up" they can be used as derricks for loading or discharging cargo. Her engines are of the triple-expansion type, and will drive her from 12 to 13 knots an hour in fairly smooth water. She is expected to make the trip in less than 10 days. The Runic's

vibration. The weight, without wheels, is 1600 pounds; height from floor to center of spindle, 4½ inches; height of base, 30 inches; length of two outside bearings, 8 inches, and are self-oiling; length of two inside bearings, 6 inches, located each side of pulleys—these are not shown in cut; diameter of spindle in bearings, 2½ inches; diameter of spindle where wheel goes on, 2 inches; distance between wheels, 60 inches; distance spindle extends beyond frame, leaving clear space, 21 inches; entire length of spindle, 71 inches; spindle pulley, 8 x 6 inches; carries two wheels any size up to 60 inches diameter; floor space of base, 34 x 34 inches; driving pulley on countershaft, 20 x 6 inches. This grinder is made by the Springfield Glue and Emery Wheel Company, of Springfield, Mass.

The Namaqua Copper Company, whose mines are at the Cape of Good Hope, have declared an interim dividend of 2/ per share, being at the rate of 20 per cent. per annum.



JOHN ERICSSON.

34

A New Alligator Shear.

The accompanying illustration shows a new and recently designed alligator shear which has just been put on the market by Thomas Carlin's Sons, founders and machinists, of Allegheny City, Pa. The main features in the construction of this shear are as follows: The bed is very wide

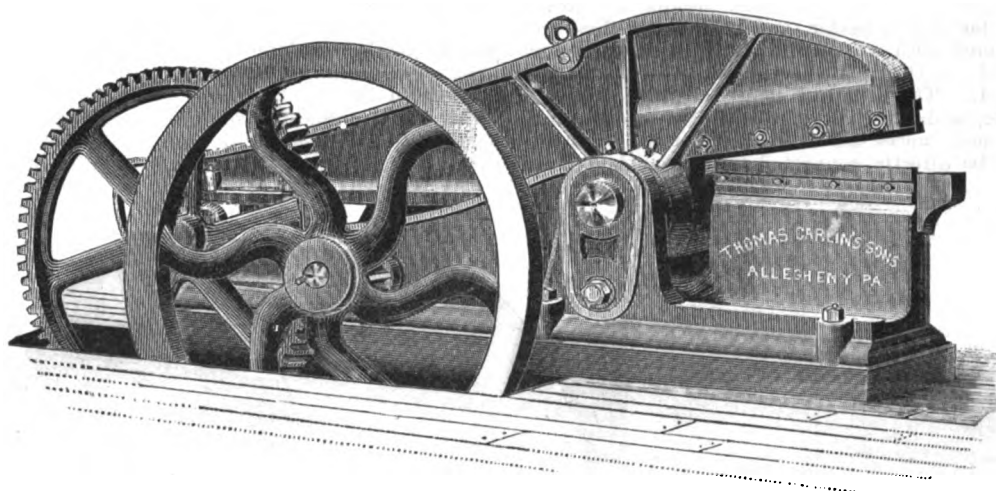
shear are steel, and their journal bearings are extra long. These shears are designed to cut $\frac{3}{4}$ -inch agricultural steel.

Gas Engine and Pump Combined.

The combination of the Otto gas engine and pump herewith illustrated is intended to avoid the difficulties frequently

order to furnish a varying quantity of water as required by hydraulic elevators. In this case the slide of the by-pass valve is acted on by a float in one of the elevator tanks, or by a piston and weight, which act when pressure in the accumulator reaches its limit.

The makers of these pumps, Schleicher, Schumm & Co., of Philadelphia, guarantee

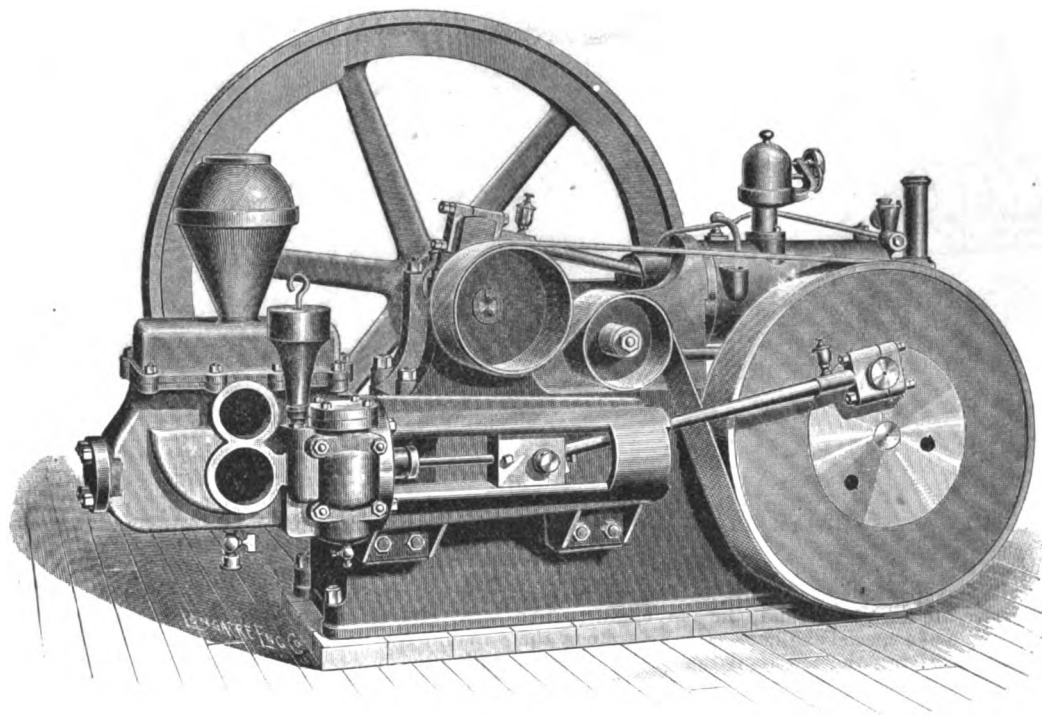


ALLIGATOR SHEAR, BUILT BY THOMAS CARLIN'S SONS, ALLEGHENY CITY, PA.

on the base, and has lugs for securing it to the foundation, a 2-inch bolt through the bed under the pin adding considerable stiffness to it. The hubs of the housen are reinforced by wrought-iron links. The knives are set well back under the lever and bed to prevent spalling off, due

met with in bringing power to pumps by means of belting or countershafts when pumps are preferably run at slow speed and with the highest efficiency. This pump is also intended to take the place of rotary or high-speed reciprocating pumps, chosen in order to save room. All danger

that they will pump more water and at less cost, with the size of engine attached to them, than other pumps when driven by the same size of engine. This enables the makers to use smaller sizes of engines to do the work for which their larger sizes have heretofore been selected in connection with



GAS ENGINE AND PUMP COMBINED, BUILT BY SCHLEICHER, SCHUMM & CO., OF PHILADELPHIA.

to the crushing strain at these points. The lever is long and is heavily ribbed for the vertical and side strains to which it is subjected, and for convenience in handling an eye has been put in it. The quick-return cam is chilled on its face, and has a steel plate dovetailed into lever for it to work against, which is cushioned, and has also a safety yoke around the cam. The gearing is heavy, is 7 to 1, and is driven by 80-inch and 8-inch tight and loose pulleys. All the shafts connected with the

of water-hammering is avoided by reason of their slow speed, and as the gears used in them are accurately cut all noise is reduced to a minimum. By means of a by-pass valve the engine can be relieved of all work. When this valve is open the water in the pump cylinder merely circulates from behind one end of the pump piston to the other, and thus admits of starting the engine without load. The by-pass is also used for stopping or starting the delivery of water in an automatic manner in

less efficient and generally high-speed pumps.

About \$1,000,000 will be expended by the Pennsylvania Railroad Company in elevating the surface railroad tracks in Jersey City.

Fargo disputes with Bismarck in North Dakota in the struggle now taking place for recognition as the permanent capital of the new State.

Sturtevant Steam Hot-Blast Apparatus.

The house of B. F. Sturtevant, Boston, Mass., has just brought out a new design of a steam hot-blast apparatus, which is now well known. This design, first placed upon the market a quarter of a century ago, has been gradually improved and rapidly introduced until now about 5500 are employed for various purposes. It combines a fan and a heater, and is usually constructed with an engine directly connected to the fan shaft, as shown in Fig. 1. The shell and wheel are of steel plate, and the shaft of steel, while all stays and braces are of angle. The engine may be directly connected to

through the horizontal pipes, and down into the space connecting with the drips. By this time it has condensed, and leaves the heater in the form of water of condensation. The sides of these heads are planed, and the joints made by copper gaskets, so that when drawn together by the through bolts there is no possibility of leakage. In connection with the sections is bolted on at one end of the group a header for steam inlet and a drip, B. Both of these are large and allow the use of exhaust steam without creating back pressure upon the engine. The pipes C D are, respectively, exhaust-steam inlet and drip communicating with the outermost section, which has no head and is entirely independent of the remainder of the group.

ordinary manufactory the distribution takes place through galvanized-iron piping, either in the form of upright mains extending to the various floors and having one or more outlets near the ceiling on each floor, or in other cases horizontal mains extend the entire length of the building just under the ceiling on each floor and the air is discharged through outlet in these. In schools, churches, &c., the air is generally conveyed through flues built into the interior walls, the volume and rate of discharge being governed by the register through which the air escapes. The object is always to discharge the air either at or toward the cold outer wall; but in this, experience is necessary in order to enable one to lay out

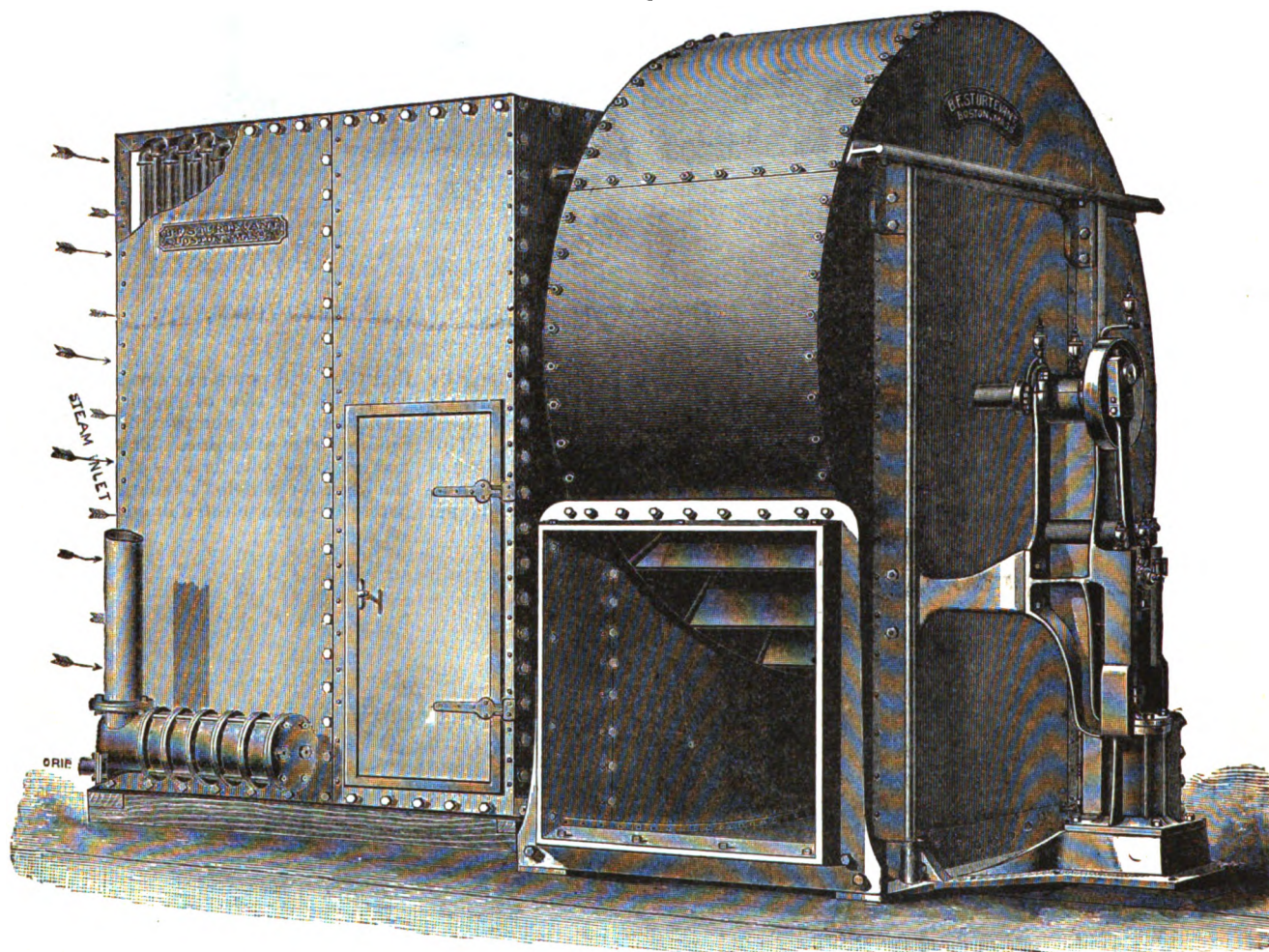


Fig. 1.

STURTEVANT STEAM HOT-BLAST APPARATUS FOR HEATING AND VENTILATING.

the fan shaft, or it may be independent and arranged to drive the fan by belt and pulley. The advantage of a special engine for the sole purpose of driving the fan is evident. The fan may then be run at any time and speed, independent of any other source of power. Radical changes have been made in the heater, which forms a very important factor in the combination. As now constructed, the heater proper consists of a series of hollow sectional bases, shown clearly in Figs. 2 and 3. Their sides are corrugated so as to fit closely together and allow of no alternate expansion and contraction of the air passing between the pipes. At one end of each section is a circular head, Fig. 2, divided horizontally by a diaphragm, so that the upper portion is in communication with the steam inlet and the lower with the drip. Steam admitted at the left through the steam inlet passes up the series of pipes,

It is designed to utilize the exhaust from the fan engine. The head end of each section rests upon the wrought-iron foundation of the heater, while the opposite ends are supported by cast-iron balls, so as to allow for expansion. After continued use of wrought-iron pipe the maker of this apparatus adopted steel pipe as better adapted for use in his heaters, and has it made especially for him of standard weight per foot. The heater is incased in a fire-proof steel-plate jacket, communicating with the inlet to the fan, so that air is drawn by the fan equally across all parts of the heater, and, as the pipes in the sections are set staggering, the air is compelled to take a tortuous course and is brought into intimate contact with every foot of pipe. In operation for heating and ventilating, the outlet of the fan is constructed with a system of ducts or pipes leading to the various parts of the building. In the case of an

a perfect working system. This, the blower system, is positive in its action; the air being forced into the building must of necessity thoroughly circulate through it. As the source of supply of the air introduced is under control, there can be no opportunity for the presence of injurious impurities. Changes in the weather produce no injurious effect upon the system, since the pressure produced by the fan is far in excess of that due to changes in the atmosphere. The large amount of air passing through the heater causes a rapid condensation of steam, and each square foot condenses from three to five times as much steam as would be condensed by the same area in an ordinary coil radiator. In other words, it is claimed that only one-third to one-fifth of the pipe is required to do the same amount of heating. All the pipe is combined in a single heater, and all valves are within easy reach, placing the entire control of the apparatus in the hands of a

single individual. In addition, it is claimed that a more rapid change in the temperature of the building is possible with this system than with any other, either direct or indirect. This method is now in use in some of the largest manufactories in the country.

Industries of Lansing, Mich.

A Western daily publishes the following interesting information relative to the manufacturing interests of Lansing, Mich., which have been developed almost wholly within the past four years: Among the prominent manufactories of Lansing, foremost mention must be made of the Lansing Iron and Engine Works, which were established in January, 1885. The company succeeded the copartnership of Jarvis, Barnes & Co., and since their incorporation with a capital of \$100,000,

the facilities. This factory was only established three years since. A business is being done of \$200,000 a year. James J. Baird is president; Orlando F. Barnes, vice-president, and Frank E. Briggs, secretary and treasurer.

The Lansing Wagon Company, with a capital of \$100,000, turn out over 3000 wagons a year, and are reputed to manufacture as fine a wagon as any in the country. Farm, lumber and freight wagons are made and the works are taxed to their utmost capacity. The Capital Wagon Company also boast of many new and important inventions, and claim for their manufactured goods by comparison a high position and an undoubted superiority. Anderson & Bush's manufactory has a capacity of 3000 road carts a year. The business was established last July. Orders for their goods come chiefly from the East, but their trade reaches Kansas and Nebraska. They manufactured goods last

that kegs of 200 pounds average 15 more spikes. This spike is rolled complete at a single heat through Fowler's patent spike rolls, forming the head without bending or upsetting the metal or breaking its fiber. This is accomplished by rolling down the shank of the spike from a bar of peculiar shape and larger in cross sections than the head of the spike itself. The method of manufacture, the machinery employed and the spike itself are covered by six distinct patents.

Edison Exhibit at Paris.

The Edison exhibit at the Paris Exposition will, according to the *New York Tribune*, occupy nearly one-third of the entire space allowed the United States. The display of phonographs will include the original instrument now in the South Kensington Museum, London, together with those showing the latest improvements. The telegraph department will contain models of all the machines Mr. Edison has worked out. In the telephone division there will be a chronological arrangement of all the devices from the original "Blake transmitter" down to the latest loud-speaking telephone. In electric lighting there will be a complete three-wire municipal system extending over all the exhibit. The principal feature of the exhibit will be an enormous model of an incandescent lamp, 40 feet high, the globe being composed of no less than 20,000 incandescent lamp bulbs, and the carbon filament within being indicated by a loop of red-colored incandescent lamps. The effect when the light is flashed into these thousands of bulbs will be wonderfully brilliant. Around the base of this novel lamp will be a series of panels illustrative of the various stages of the manufacture of in-

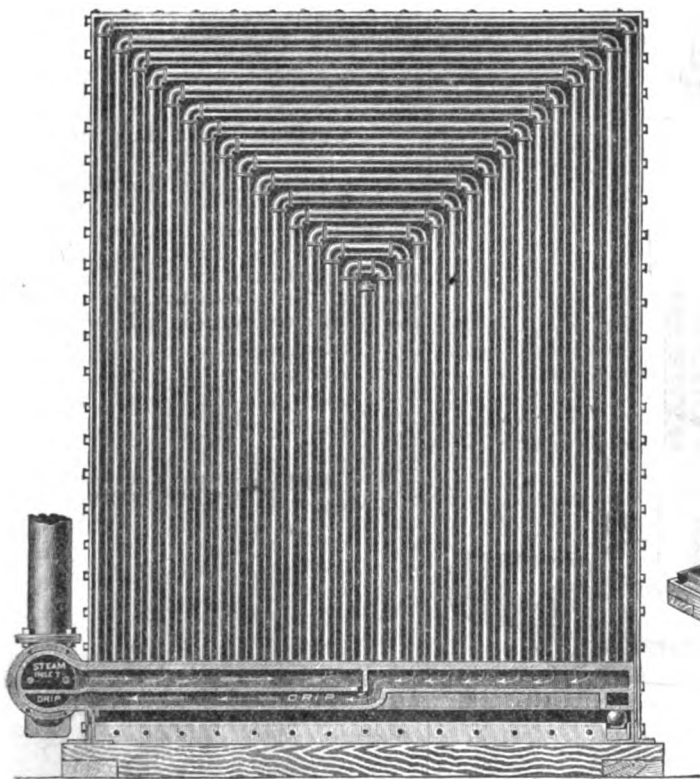


Fig. 2.—Heater for Sturtevant Hot-Blast Apparatus.

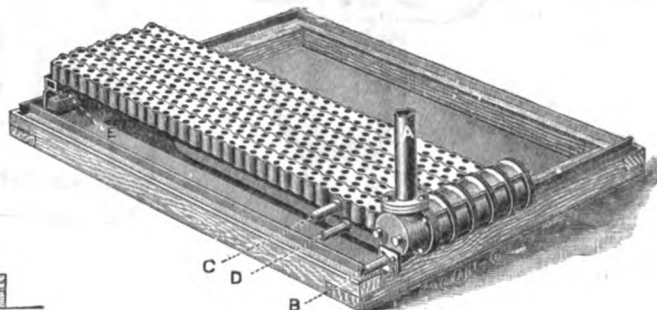


Fig. 3.—Detail of Heater.

the expansion of the industry has been so marked that its volume of business reaches \$350,000 a year. The character of the engines manufactured by the company is shown by their increasing business, and they have in connection one of the largest boiler shops in the State. They also manufacture compressed air-cylinder derricks for handling heavy machinery and mill, railroad and mine supplies.

Next in importance may be mentioned the Lansing Wheel Company. Michigan can boast of only one carriage-wheel manufactory, and that is operated by the Lansing Wheel Company. In this factory 30,000 sets of wheels are made in a year, and employment is given to a large number of men. The making of carriage-wheels to-day is very different to what it was in the days of old. The rapidity with which all the work is done is remarkable. It takes the spoke driver about 15 minutes to place the spokes in a set of wheels, the machine working on the wheel is done in half that time, the rimmer does his work on a set in 10 minutes, and the set is finished in 40 minutes. The works are so constructed that they can turn out 150 sets a day, and it is the intention to increase

year to the amount of \$75,000, and are now about to build and increase their facilities.

The blast furnace men propose at the next convention of the Amalgamated Association of Iron and Steel Workers to make an effort to be admitted by that organization, if possible. The furnace-workers are now paid by the day, but they believe that in the major part of their work they should be paid by the ton, as their work requires fully as much skill as to puddle iron. Should they be admitted, fully 9000 additional members will be gained by the Amalgamated Association.

The Fowler Rolling Mill Company, 185 Dearborn street, Chicago, are putting a railroad spike of improved shape on the market. The spike has a sharp chisel point, and its shaft is trapezoidal in cross section. This form, it is claimed, presents greater resistance to the thrust of the rail than other spikes, while the sharp point tears the fiber of the tie less. Its weight is less than that of the standard spike, as there is no waste metal in its formation, so

candescant lamps, and on either side will be the French and American flags worked out in colored incandescent globes. One will be inscribed "Paris," and the other "Edison." Among other novelties will be a huge dynamo capable of running 2000 lamps, one of the largest dynamos that has ever been constructed. An interesting feature will be a series of charts, 100 in number, showing the growth and development of all Mr. Edison's inventions from the first crude idea, through all the successive stages, to the complete and perfected instrument. There will be a number of frames showing the filaments in their natural condition, and after being carbonized, with samples, arranged in chronological order, of all the substances that have been experimented with in this direction.

An interesting map of the first electric central station and district in New York will also be exhibited, with a tabular statement showing the growth of the business from a net loss of \$4457 in 1883 to a net profit of \$116,235 in 1888, and this despite the reduction of gas to \$1.25 per 1000 feet, while the equivalent cost of electric light is \$2.25.

The Pierce Air-Valve.

Both the accompanying cuts are full size, Fig. 1 showing the valve provided with dip attachment, Fig. 2 being without the dip. The valve is both automatic and positive. With this combination the positive valve can be opened to heat up the radiation at once, without waiting for the air to be forced out through the automatic. To increase the durability and prevent corrosion all metal parts of the valve are nickel-plated both inside and out. The expansion and contraction of the hard rubber body, responding quickly to heat

\$62,500, the proceeds of the sale of which were to form the working capital of the company. The complainants' interest consists of the purchase of \$5000 each of this stock, and 1625 shares of the stock in all were sold, realizing about \$100,000. George M. Pullman purchased all of Mr. Doane's stock—about 1000 shares—although the stock has never been transferred to him on the books. Extensive works were erected at Pullman for the manufacture of spikes, and a rolling mill was also built at Mr. Pullman's suggestion, it is claimed, increasing the cost of the plant about \$20,000. The

company has been to furnish iron and iron-work for the Pullman Palace Car Company and for their especial benefit, the latter company dictating prices below that of the market. The liabilities of the Pullman Iron and Steel Company are stated to amount to \$302,256.07, while the total assets are \$279,618.19, the greater portion of which are in the plant, which cost \$190,046.54. Of the indebtedness \$180,000 is to the Pullman Palace Car Company. The railway spike patent is claimed to be worthless and to have been practically abandoned. The court is asked, therefore, to order the property sold by the receiver, to direct an accounting to be taken, and that the proceeds may be divided pro rata among the stockholders according to their interest.

The filing of this bill will hardly affect the credit of the company, as long as it is understood that the Pullman Palace Car Company are interested in keeping the works in operation, but the experience of these outside stockholders is very instructive to others who are inclined to invest in auxiliary corporations operating in connection with large consumers of their products.

Upright Power Hammer.

Appreciating the fact that the hammer as previously made was not quite strong enough in some parts, the Belden Machine Company, of New Haven, Conn., have remodeled and made an entirely new set of patterns. The gearing has been simplified, the ways strengthened, and the body in-

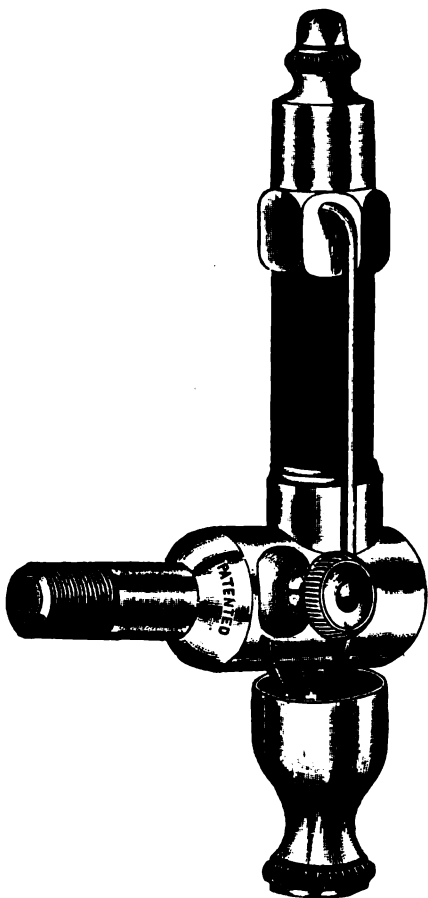


Fig. 1.

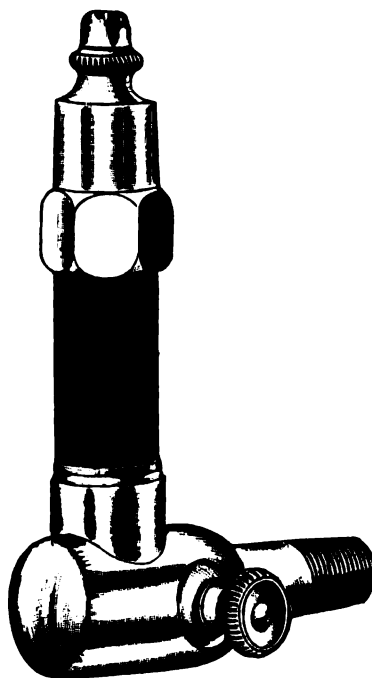


Fig. 2.

THE PIERCE AIR-VALVE.

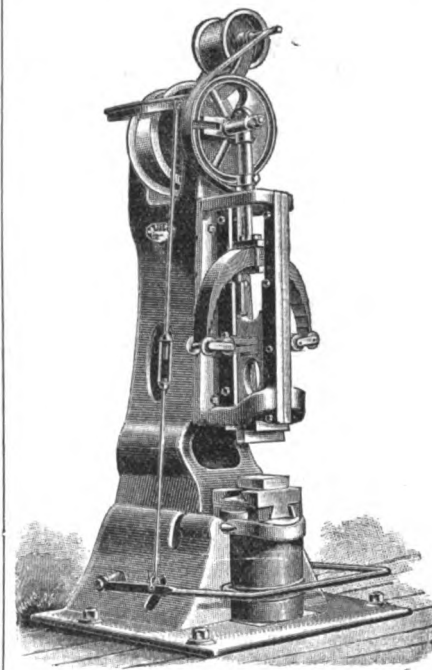
and cold, render the automatic part reliable, while the positive is available whenever required. This valve is made by the Pierce, Butler & Pierce Mfg. Company, of Syracuse, N. Y.

The Pullman Iron and Steel Company.

Some interesting information has been given to the public relative to the Pullman Iron and Steel Company, operating a rolling mill at Pullman, near Chicago. This information comes through the filing of a bill on the 4th inst., by Francis T. Wheeler and Lucius G. Fisher, asking for the appointment of a receiver for the company. The complainants own \$5000 of stock each in the company. They say that October 8, 1883, Frank B. Felt and James P. Perkins were owners of one-half a patent on railway spikes, the other half being owned by George M. Pullman and John W. Doane, Mr. Pullman's interest, however, being in the name of James H. Smith, his private secretary. A corporation was formed with a capital of \$500,000. The four stockholders contributed equal amounts out of their stock aggregating

works were completed in the spring of 1884, and have been run, the complainants say, ever since, at a loss to the company. The spike manufacture was almost entirely abandoned as a failure, and the principal business of the company has been the manufacture of bar iron. The works and machinery were found to have cost more than the working capital, which was about \$116,000, and in July, 1884, the company mortgaged their property to secure an issue of \$100,000 of bonds. Of this issue \$25,000 worth of bonds were sold at par. The company still losing money, they borrowed at various times from the Pullman Loan and Savings Bank, of which George M. Pullman is president and controlling officer, sums of money aggregating \$56,000, for which the bank holds the \$75,000 of unsold bonds as security.

The Pullman Palace Car Company, according to the bill, in 1885 extended credit to the Pullman Iron and Steel Company by which the latter were enabled to purchase materials and continue in operation up to the present time. The complainants charge, however, that through the control of Mr. Pullman as principal stockholder almost the entire business of the iron and steel



Upright Power Hammer.

creased in every place where there was a possibility of its being weak. The manufacturers now claim that this hammer can be run at a higher rate of speed and with less jar or liability of breaking, as there are no valves, rods or cylinders, than any other. As every part is plain and simple, the repairs are trifling. It is further claimed that it requires less power and occupies but little space. The dies are never on the work when the hammer is still. The anvil block is made separate, and if broken can be replaced at a small cost. Stock varying from $\frac{1}{4}$ inch to 3 inches can be worked without trouble. The changes made in this hammer were made only after a use extending over several years in the works of the manufacturers.

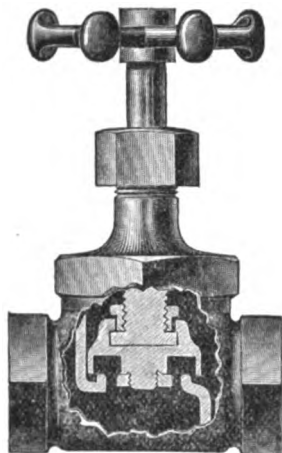
The Frisbie Valve and Union.

The cylinder valve here illustrated is so designed as to do away with the necessity of disconnecting the valve from the pipe in case the seat becomes worn. This is accomplished by making the disk independent of the stem, but held in position by a cast shoulder. The face of the disk is concave and filled with packing, which is prevented from spreading by the metal walls on the disk. The advantages claimed are that in case of wear the disk may be re-

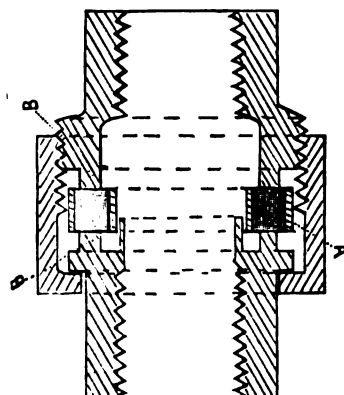
active when industry is paralyzed; the ordinary payments in legitimate business or in settlements with labor. Obviously these classifications comprise elements too uncertain and intangible to serve as a basis for definite conclusions. Returns of skilled labor employed, prepared at regular intervals, as in England, are of some value as an index of the business situation, and in the United States we have at command, in the statistics of the Labor Bureau, if promptly published, a source of information that should be availed of to

so, after removing a few times, it is unfit for further use and has to be renewed. At the same time this is generally the leaky part of the boiler, and is a continual eye-sore to a skilled mechanic.

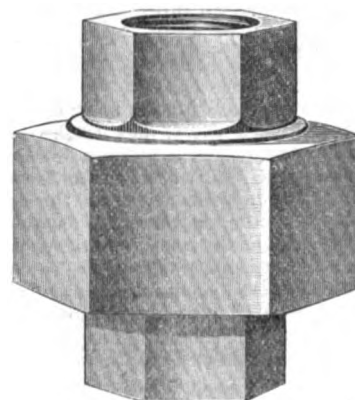
With the common use of steel in boiler-making many changes have been made possible and one of the most decided improvements is the form of man-hole opening called Eclipse man-head, which is illustrated herewith. This opening is flanged by a machine especially made for the purpose, the same as if it



THE FRISBIE VALVE.



THE FRISBIE UNION.



moved by unscrewing the nut of the valve, when the concave part can be refilled and placed in position in a short time.

THE FRISBIE UNION.

In the union illustrated the gasket A is held between two metal rings, B B, the space between which is filled with any suitable packing, which is held firmly in position by the rings. These gaskets are furnished the trade in all sizes and filled with asbestos, babbitt or rubber by the

fullest extent. Reports of this character reflecting the condition of a wide range of industries would become invaluable.

The Eclipse Man-Head.

For the purpose of securing entrance to tubular or flue boilers it is the custom to cut a hole in the shell or head large enough to admit a man's body. This

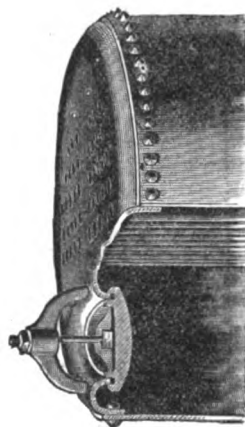
were a flue-hole. The uneven surface is planed level. The man-head plate has a recess or channel, in which molten lead is run, forming a gasket, and prevents it spreading or thinning out under pressure. The bolts and crabs are the same as in the old form. Therefore it will be seen that the flanged and planed opening presents a perfectly level, hard surface against the perfectly level, soft surface of the lead, so there is no chance of a leak and no unequal strain on the boiler, gasket or plate.

Where a boiler was weakest in the old form it is now the strongest, without an increase in weight. Briefly, the advantages gained are strength, improved appearance of the boiler, freedom from leaks, economy in the use of gaskets and ease of entrance to the boiler. It has now been in practical use for over a year in many sections of the country with unqualified success.

The Eclipse man-head and the machines for making it are patented by R. Munroe, of Pittsburgh, a practical boiler-maker of 50 years' practice. Consumers or boiler-makers can obtain this improvement and all information regarding the same by addressing Mr. Munroe, as above, or Joseph T. Ryerson & Son, at Chicago, the sole licensees for Chicago and the West.



THE ECLIPSE MAN-HEAD.



makers of both the union and valve, the Barnett Brass Company, of Mansfield, Ohio.

An improved business barometer is one of the wants of the times. Bank clearings, railroad earnings and even reports of tonnage by the main lines of transportation are all misleading as indications of the volume of current business. Bank exchanges are deceptive, because they report indiscriminately in one aggregate three kinds of transactions, viz., payments on purchases made at any previous time, but especially the settlements on maturing commercial paper, of various dates; purely speculative operations, which are often

hole is oval, and around it is riveted a wrought or cast iron ring of the same internal diameter as the opening. In service this opening is closed from the inside by a cast-iron plate called "man-head plate," which is held in place by bolts and crabs. To secure a steam-tight joint a gasket of rubber, asbestos, lead or other yielding substance is placed between the boiler-head or shell and the man-head plate. In practice it has been found difficult to secure a perfectly flat or even surface, so that it has been necessary to draw the man-head plate tight against the boiler that the gasket might be forced into all the uneven surfaces. This gasket, therefore, is often forced out of shape;

In the French Chamber of Deputies M. Villain moved an order of the day appealing to the Government to safeguard the interests of the shareholders of the Panama Canal. M. Rouvier, Minister of Finance, disclaimed any responsibility on the part of the Government. He said the Government had no means of interfering, although it approved of every effort made by capitalists and companies to prevent the collapse of the undertaking. Prime Minister Tirard, replying to M. de Cassagnac, said the Government would do its utmost for the success of the canal, but he could say no more. The chamber, then, by a vote of 344 to 185, adopted a Government order of the day in regard to the canal. The Court of Appeals decided that the Panama Canal Company is a civil association, thus reversing the decision of the Tribunal of Commerce that the company was a commercial society.

THE WEEK.

It is remarked that the Interstate Commerce law, which provides for the regulation of railway traffic between the States by federal law, has come to stay, and becomes ingrafted upon the established policy of the United States. Congress has shown no disposition to recede from the high ground originally taken, and President Harrison in his inaugural address affords no encouragement to corporations that may have hoped to evade or practically nullify the laws holding them to due accountability and restraint.

The latest Havana advices report a probable decrease this year in the Cuban sugar crop equal to 40 per cent., equivalent to about 200,000 tons compared with the previous crop.

The scheme for a bridge to Long Island, crossing the East River at Blackwell's Island, has encountered an adverse decision in the Supreme Court, Judge Van Brunt having refused an application for the appointment of commissioners to acquire land. He upheld the argument of Assistant Corporation Counsel Twombly, in opposing the application, that the act of 1885 gave authority to a private company to lay railway tracks over the bridge in violation of the provision of the Constitution of the State.

Plans for the improvement of wharf facilities on the North River front were brought to the attention of the New York Chamber of Commerce at its last meeting by President Post, of the Department of Docks. As a large expenditure of money is involved, the approval of the chamber was desired. Some years ago the present engineer in chief of the department suggested a change in the original "new plan" so that the North River front, between Eleventh and Twenty-third streets, might be utilized, and the commercial possibilities of the North River increased some 25 per cent. The change contemplates the extension of West street, with a width of 250 feet in a straight line from West Tenth to West Twenty-third street. Excepting the blocks upon which the West Washington Market is erected and the excavation of the land to the west of the street, the property for this improvement should be purchased by the city. This improvement gave 25 per cent. more wharf room and seemed to be the only way by which the city could be rapidly prepared for its increasing commerce. If it were adopted 19 large piers, 2 half piers, and 2 small piers could be built which would yield to the city a revenue of \$800,000 a year. Its total cost would be about \$8,861,000. Deducting the yearly taxes now received by the city on the property to be purchased, amounting to \$63,000, the net income to the city would be \$737,000, or over 8½ per cent. on the investment, without taking into consideration the increased amount of business which would accrue to the benefit of the city. The subject was referred to the Committee on Harbor and Shipping.

Canadian trade is reported to be suffering for want of a foreign market. All the industries are affected. Trade with Australia is without profit, the costs of transportation being too large. The most promising markets are South America and the West Indies.

Sidney Dillon and other capitalists in New York and Pennsylvania are about to lay pipes in Philadelphia for steam-heating purposes, a location for the central plant having been already purchased.

A falling off in the tide of immigration is noticed at Castle Garden. The arrivals during the last six months number 107,680, a decrease of 21,500 compared with the same months last year. A better class of

immigrants are coming than formerly, as foreign governments have learned that we will not receive ex-convicts and paupers.

The present debt of Canada, as shown by the Minister of Finance, is \$236,000,000, an increase of 120 per cent. in 14 years; but the customs tariff now in force is expected to yield a surplus. While trade with the United States largely increased last year, that with Great Britain shows a marked decline.

An official report of the results of the horse-car strike in this city as affecting the men engaged in it shows that not less than 2783 men lost their positions, entailing severe hardship. Master Workman Magee, who acted a prominent part, affirms that it is the purpose of the railroad managers to drive out of the business all who were identified with the Knights of Labor; that on some roads none of the old men are restored.

The January exports from San Francisco were the largest for the same month in the history of the city, with a single exception. The total valuation was \$3,791,674, of which \$2,611,354 were to Europe and \$1,180,326 to Pacific ports. Among the latter the Hawaiian Islands lead with \$296,000. China, Mexico, Australia and Central America are next, in the order named. Mexico is doing better than before for a long time, while Australia is falling off.

The leading cities and towns of the new State of Washington are Tacoma, Seattle, Spokane Falls, Ellensburg, North Yakima, Port Townsend and Whatcom, all entering upon a prosperous career. The *West Coast Trade*, a weekly paper just started in Tacoma, holds that "Tacoma possesses by right of situation unusual advantages as a jobbing center. Located at the head of ocean navigation, in the midst of as rich and fertile a country as the sun shines upon, it is evident that kind nature intended the 'City of Destiny' to become a supply point, not only for Washington Territory, but eastern Oregon, Idaho and Alaska. There are other corroborative arguments to this claim. Tacoma is the terminus of the great trans-continental railroad in the United States; the terminus of the Japan and China trade; the terminus of the steamship lines to Alaska, and terminus of various lines of boats plying the waters of the sound. Last fall the East was startled by the fact that the surplus wheat of the great inland empire could be shipped through the port of Tacoma and sold in Liverpool in competition with wheat grown on the Atlantic. Our hops command the highest market price in Liverpool. The Nicaragua Canal will be completed some time, and then Tacoma will be 8000 miles nearer New York and 6000 miles nearer Liverpool than she is to-day, and her position as a jobbing point will be second to none in the country."

A. J. Drexel has determined to establish "The Drexel Industrial College for Women," at Wayne, Delaware County, Pa. The entire expense of the institution, including endowment, will reach, it is said, \$1,500,000.

Our seacoast defenses for the better protection of harbors are the subject of earnest inquiry by the Army Board on Ordnance and Fortifications, and the board is now convened at the War Department to further consider the plans of designing engineers. In accordance with the act of Congress, the Watervliet Arsenal, at Troy, N. Y., is now being rapidly converted into an army ordnance gun foundry, at which place the heavy guns for the seacoast defense will be put together. The forgings for this large caliber of ordnance have been contracted for. Reports have been received from Lieut. W. Crozier, of the Ordnance Corps, who was sent abroad about

three months ago especially instructed to make a specialty of gun carriages, and from Lieut. F. E. Hobbs, whose efforts were to be confined to the latest improved method of producing steel. A large order for munitions of war was received at the Allegheny Arsenal on Saturday.

All traffic on the Columbia River and Puget Sound, so far as the Oregon Navigation and Railway Company are concerned, has been wholly suspended, officers and men refusing to work at the proposed 10 per cent. reduction.

The endurance of the steam-engine is well illustrated in the case of the White Star steamship *Germanic*, which has made 280 trips across the Atlantic and steamed nearly 1,000,000 miles. On a recent trip she arrived at Queenstown in 7 days 9 hours and 27 minutes from Sandy Hook, or five hours less than her best previous voyage.

It is again reported that the Oceanic steamship line from San Francisco to Australia will withdraw from service at the end of October, as the North German Lloyd Company, heavily subsidized, are arranging to secure it. Some years ago Wm. H. Webb, of this city, maintained a line to Australia for a considerable length of time, but was compelled to abandon the enterprise for lack of substantial encouragement.

Secretary Tracy has appointed Frank A. Dennette mechanical superintendent of the gun foundry in Washington city. This position has remained vacant for some time, owing to the inability of the Navy Department to procure a competent man for the place. Mr. Dennette has been in the employ of the Bethlehem Steel Works for some time and lately with the South Boston Iron Works.

Justice Cullen, of the Brooklyn Supreme Court, decides, in the case of Mr. Higgins, soap manufacturer, that the certificate of inspection from the insurance company does not exempt owners of boilers from inspection by the constituted authorities.

Legislative delegates from nearly all the cattle-growing States are holding a convention in St. Louis to defeat the alleged beef and pork combination.

By the will of J. V. Williamson, admitted to probate on Monday, another \$1,000,000 is given to the charitable institutions of Philadelphia, including nearly all the old well-established hospitals and homes and some libraries, educational institutions and miscellaneous charities. Noticeable among the gifts of special importance are \$25,000 to the Apprentices' Library and \$20,000 each to the Academy of Natural Sciences and the Academy of the Fine Arts. The crowning act of Mr. Williamson's philanthropic life was the gift of \$2,500,000 for the founding of the Williamson Free School of Mechanical Trades, which is to be built as soon as a location is decided upon. The affairs of the project are now in the hands of a board of trustees selected by Mr. Williamson. The estate of Mr. Williamson will amount to between \$8,000,000 and \$9,000,000, exclusive of the fund for the mechanical school.

Prospects for the completion of the Hudson River Tunnel to connect the railroads terminating in New Jersey with this city have suddenly become brighter. Colonel Haskin, the indefatigable projector, ceased operations only when funds became exhausted. Quite recently an effort to raise money was attempted in London. The *London Financial News* says that the applications for the issue of \$1,500,000 first mortgage 6 per cent. bonds of the Hudson Tunnel Railway Company have exceeded \$2,500,000.

MANUFACTURING.

Iron and Steel.

A press dispatch from Pottsville, Pa., under date of the 5th inst., says: "The employees of the Fishbach rolling mill of the Pottsville Iron and Steel Company, which has been idle for several weeks on account of a reduction of wages, held a meeting in this city to-day to consider a compromise proposition offered by the company. A reduction of 10 per cent. for the tonnage-men was agreed to, with the understanding that as soon as an improvement in the market warrants it the men shall have the benefit of the advance. On the day-men it was agreed that there should be a partial reduction confined to those receiving the higher rate of wages. The agreement has been ratified by both sides, and the mill will start up in all departments tomorrow morning, the entire force of some 800 employees resuming work."

The new Soho Furnace of the Moorhead-McCleane Company, at Pittsburgh, produced 5550 gross tons of pig iron last month.

Mr. S. R. Smythe, secretary of Swindell Construction Company, Lewis Block, Pittsburgh, Pa., engineers and contractors of regenerative gas furnaces, &c.; informs us that his company have changed the name of their firm to the Swindell & Smythe Company, as there are several construction companies, in the same and other businesses, which conflict somewhat with theirs. They will continue to carry on the same business. All the members connected with the Swindell Construction Company will still continue to hold the same interest in the newly-named firm as before.

No. 1 furnace of the Isabella Furnace Company, at Etna, Pa., for the week ending February 16, produced 1812 gross tons of pig iron, and for the following week produced 1810 gross tons. For the month of February just closed both stacks produced 11,974 gross tons. This is certainly an enviable record.

The Scottdale Iron and Steel Company, Limited, of Scottdale, Pa., will soon commence the erection of an additional sheet mill.

Carnegie, Phipps, & Co., Limited, of Pittsburgh, operating the Beaver Falls Mills, at Beaver Falls, Pa., are making some extensive improvements and additions to the plant. An order for 50 wire-nail machines has recently been placed with the National Machinery Company, of Tiffin, Ohio, which will be placed in the works at an early date.

A dispatch from Findlay, Ohio, under date of the 8th inst., reads as follows: "The Findlay Iron and Steel Company to-day passed into the hands of a receiver, owing to financial complications contracted before the removal of the plant from Cincinnati. The liabilities are said to be \$30,000. C. H. Emerson was made receiver."

The Stewart Iron Company, Limited, of Sharon, Pa., are operating Nos. 1 and 2 blast furnaces and 13 puddling furnaces to their full capacity.

The nail factory of the Kelly Nail and Iron Company, at Ironton, Ohio, which has been idle for some weeks, has resumed operations in full again.

It is expected that the present week the entire new plant of the Allegheny Bessemer Steel Company, at Duquesne, Pa., will be in operation. The blooming mill has been in operation for several weeks, and a large supply of blooms being secured, it has been decided to start up the rail department. It is understood

that the company have booked some large orders for rails, sufficient to run the plant full time for some months to come. H. P. Smith, the secretary of the company, who has been in the South since November last, for the benefit of his health, is reported greatly improved and will probably return to Pittsburgh some time during the early part of April next.

During the month of February just closed the blast furnace of the Bellaire Nail Works, at Bellaire, Ohio, produced 4559 gross tons of Bessemer pig iron, or an average of about 163 tons per day.

For the month of February the blast furnace of the Belmont Nail Company, at Wheeling, W. Va., produced 3200 gross tons of Bessemer pig iron.

The nail factory of the Junction Iron Company, at Mingo Junction, Ohio, closed down on Saturday, the 2d inst., for an indefinite period.

A despatch from Youngstown, Ohio, under date of the 7th inst., says: "James Friend and Adrien Hoffstot, of Pittsburgh, with Lloyd Booth and Ralph J. Wick, of this city, have purchased the rolling mill of the Wheeler Iron Company at West Middlesex, which has been idle for the past two years. The price paid was \$8625. The plant cost \$135,000, and most of the machinery is in excellent condition. The purchasers have not decided whether they will operate the plant or dispose of it to other interests."

A boiler in the forging department of the Cleveland Rolling Mills, at Cleveland, Ohio, exploded on Monday morning.

A dispatch from Atlanta, Ga., announces that the Cartersville Furnace Company, the Etowah Company and the Daisy Coal Company now constitute one corporation, under the name of the Etowah Land and Mining Company, with a capital stock of \$1,750,000, with the privilege of increasing it to \$5,000,000. The work will proceed through trustees until the charter is granted. The work on the furnace has been suspended pending negotiations, and the general plan will now be greatly enlarged, and as soon as the new plans have been fully agreed upon the work will be rapidly pushed to completion.

Machinery.

McGill, Manchester & Co., Limited, founders and machinists, of Pittsburgh, recently shipped to the Allegheny Bessemer Steel Company, at Duquesne, Pa., a hot bed consisting of tables and hot and cold pull-ups, weighing about 180,000 pounds. This firm are now building eight hydraulic cranes for the new steel works, at Latrobe, Pa.

Lodge, Davis & Co., of Cincinnati, are now installed in their new quarters at Lake and Canal streets, Chicago, where they have established a branch for the exhibition and sale of their lathes, planers, shapers, milling machines, &c. They make a specialty of engine lathes, with taper attachment, hollow spindle, compound rest, automatic stop to carriage and other attachments, all without extra charge. A feature of their stock is their upright drill press, with patent automatic stop to the down feed, patent quick return, &c. All tools are sold f.o.b. Chicago.

At the works of Schleicher, Schumm & Co., of Philadelphia, manufacturers of the Otto gas engines, we recently saw a twin engine which had furnished power for the entire shop for more than eight years, and which during that time had never refused service, and had cost less than \$10 yearly for repairs. A 50 horse-power gas engine of improved design will soon be placed on the market. Recent sales include two 50 horse-power engines to the Raleigh Gas

Light Company, and one of 50 horsepower to the Derby Gas Company, of Birmingham, Conn., and the Atlantic City Gas and Water Company.

The Stillwell & Bierce Mfg. Company, of Dayton, Ohio, have just engaged in the manufacture and sale of mining machinery and appliances, and for this purpose have associated with them Mr. W. H. Bowers, a mining engineer and metallurgist. The company will make leading specialties of his patented inventions.

Pedrick & Ayer, of Philadelphia, builders of machine tools, have completed plans for a new brick building having a frontage of 40 feet and a depth of 160 feet and two stories high. Upon the first floor will be placed the heavy machinery employed in the manufacture of their large universal milling machines. The iron posts of this story will be provided with powerful cranes, and overhead will be lines of track arranged so as to conveniently handle the work. The engine and boiler room, in the basement at one end of the building, will be covered with brick arching on iron beams. Above this will be the forge-room and a large steam hammer built on a special foundation. On the second floor will be the offices, drafting-rooms, pattern-shop, &c. Each department will be well lighted by an excellent arrangement of skylights.

The firm of Goodell & Waters, of Philadelphia, have in press a large and fully illustrated catalogue showing the improvements they have made in their wood-working machinery. This book—judging by the last issue, will be far in advance of the usual catalogue style—will contain illustrations of all their most important machines, together with clear descriptions of their merits.

Hardware.

The new barbed-wire department of the Cleveland Rolling Mill Company, at Cleveland, Ohio, has commenced operations with a fair amount of orders on hand.

On Wednesday, the 6th inst., notices were posted in the plant of the Wheeling Hinge Company, at Wheeling, W. Va., notifying the employees of a 10 per cent. reduction. The men refused to accept it and the works closed down. The company will attempt to operate the works with new hands, and expect to have no trouble to secure a full complement of men.

S. L. Bignall Hardware Company, 283 Lake street, Chicago, Ill., are giving their attention principally to sad irons, sinks, soil-pipe and fittings, but manufacture also pitcher spout pumps, sinks, blacksmiths' tuyere irons, tire drills, barn-door hangers, jack screws, &c.

Last week the Enterprise Mfg. Company reported 12 hands in the foundry; to-day they are running 21 and have others engaged, and expect in a very short time to report that they have all the molders they need. The former employees are trying their best to prevent new men from working, and to some extent have succeeded, but the company say that no matter how long it takes or what the cost may be they intend to have an independent shop, and not be dictated to by any more grievance committees.

The striking employees of the Ames Shovel Works, in North Easton, Mass., have been notified to vacate the corporation tenements by March 21. None of the men will return unless all are taken back, and Mr. Ames says some of them he will not reinstate. The strike is likely to affect other departments.—*Philadelphia Ledger*.

The Iron Age

New York, Thursday, March 14, 1889.

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF, JR., - EDITOR.
GEO. W. COPE, - - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS, - - - HARDWARE EDITOR.
JOHN S. KING, - - - BUSINESS MANAGER.

The Copper Situation.

The newspapers have devoted an unusual amount of attention lately to the metal trade, and have generally been hostile to the syndicate. This has probably been due to the fact that information and comment had come chiefly from disappointed metal brokers, and that the greater number of writers have been able to refer to past predictions with a triumphant "I told you so." From the point of view of the French speculators the situation is certainly very serious. It has become a question not of ultimate success, but of saving as much as possible from the wreck. There is every evidence that heroic efforts are being made to avert a complete panic, which would hurt far greater interests than those which appear on the surface.

Dealing first with the course of events on this side, we may state that in October last the syndicate made overtures to the American companies to extend the existing contracts for 12 years, making, with the two years of the existing unexpired contracts, 14 years. This extension was sought by the speculators, as it would seem, chiefly for the purpose of enabling them to induce English financiers to enter into the proposed metal bank. The American companies were not in a hurry to bind themselves for so long a period. Negotiations dragged, the scheme taking the form finally of a bank in which the American companies were to be represented by four directors, the full board deciding from time to time upon prices and upon the amount of the production. In the meantime English capitalists hung back, and the load became unmanageable for the syndicate and its backer, the Comptoir d'Escompte. The severest blow to the latter was the withdrawal by the Russian Government of its deposit of 25,000,000 francs, followed by the suicide of the leading director and a run on the bank. Simultaneously the American companies, to relieve the situation, agreed at a meeting, at which the leading producers were gathered for the first time, to reduce production 20 per cent., the understanding being that all the mines with which the syndicate had contracts in other parts of the world would do the same.

Events in Paris followed one another in rapid succession. To avert a panic the Bank of France and a number of leading French bankers came to the aid of the Comptoir d'Escompte, advancing it very heavy sums, which enabled it to withstand a run. It is now understood that the Mathesons, a large concern, closely allied with the Rio Tinto Mining Company, the leading Spanish producer, have taken over a large amount of the copper originally held by the Société des Métaux and the Comptoir d'Escompte.

So far as the mining companies in this country are concerned, the situation is the following. Every one of them received

letters of credit on bankers like the Seligman, Belmont & Co., Kidder, Peabody & Co., Brown Brothers, Ladenburg, Thalmann & Co., Müller, Schall & Co. and others for sums equivalent to the purchase price for the output of the guaranteed figure. While in the majority of cases these credits were only for one year's product, others were for the output for the whole period of three years. The mining companies delivered the copper to the agents of the syndicate, but drew against their credits only to the extent of those amounts of copper which were not sold to consumers in this country. The result has been that—at least with the majority of the Lake companies—only a small part of the sums secured to them by credits were drawn. The credits for the first year's product expire during the next few months, and it is probable that considerable balances will remain to the good of the bankers. They in turn appear to have principally worked with the Comptoir d'Escompte, although other French banking institutions are involved. Demands made by the mining companies upon the American bankers during the past few days have been promptly met. To the American mining companies the only uncomfortable feature about the situation is the certainty that the exceptional profits of 1888 are not likely to return for many a year. So far as the immediate future of the metal is concerned, it is pretty clear that the stock of the speculators is tied up in the hands of bankers who have loaned on it enough money to make it probable that the metal will not be sacrificed by throwing it over for what it will fetch.

The majority of large consumers in this country have made contracts up to June for Lake copper at 16½ cents. A few declined to enter into them, but the majority took at least a part of their needed supplies. Outside of the holdings of the syndicate and the bankers affiliated with it, very little, if any, Lake copper is available in this market, and not much can be returned from abroad in the original packages duty free. Unless some reasonable arrangement can be made their position is very unsatisfactory. The trade, the buyers in large or small quantities of copper goods, will certainly buy little or nothing now when lower prices for the raw material are established and still lower figures may be reached in the near future.

Failures in the Iron Trade.

It is a misfortune of the iron trade that undue importance is attached by the public generally to the failures occurring in it. A large dry goods firm may fail, or a great wool house may succumb to the force of adverse circumstances, and beyond the attention given to it as a matter of news no special notice of it will be taken. Hasty generalizations as to the condition of associated interests will not be made by newspaper writers, but the particular occurrence will be permitted to stand on its own basis. But if an iron concern of any considerable importance yields to financial pressure the opinion at once prevails that the entire trade is affected by "dry rot" or some other distemper, and sensational reports and interviews are worked up by the enterprising conductors of the daily press. It appears to make no differ-

ence in such cases if special circumstances in no way connected with the legitimate manufacture and sale of iron have precipitated the catastrophe. It would seem that the outside world firmly believes that the manufacture of iron is either so very profitable that errors of judgment will not seriously affect balance sheets, or so universally unremunerative that the failure of one establishment is but the precursor of widespread ruin. When the latter view is taken and a general alarm is sounded, it is remarkable that more failures do not occur through the impairment of confidence which must follow.

The iron trade of this country is not in a condition of demoralization or impending collapse, even if the recent failures would seem to convey that impression. Those who are immediately affected by these failures have good reason for taking a despondent view of the situation, but the great mass of the people who are not thus brought into positive contact with the resulting pecuniary loss or are not thrown out of employment should not permit their sympathy to control their judgment. At a time of widespread financial derangement, as in the years following the war, there was reason for grave apprehension when failures occurred. Every failure of any magnitude in such a period precipitated a train of evils involving whole communities in distress. Timidity and excessive caution controlled the money lenders, and, as nobody could foresee how sound financial order was to be brought out of the chaos of conflicting views among statesmen and students of political economy, it was no wonder that confidence almost ceased to exist and that credit became merely a tradition. It required years to correct the troubles which existed, manufacturers being obliged to accumulate fresh capital, which was a very slow process. At length upon that foundation was erected a new edifice of faith in the successful prosecution of ordinary business ventures, which exists to-day, and will continue to exist if it is not undermined by the foolish work of those who are now proclaiming general demoralization.

Possibly the recollection of those distressful times is the underlying influence causing apprehension now, particularly among those who regard the iron business as an unfailing barometer showing the condition of general trade. If they will reflect for a few moments they will remember that in 1884 and 1885 the country passed through a period of liquidation following an era of excessive railroad building and speculation. Prices dropped then to unprecedented rates, and a number of manufacturing establishments were forced to the wall. Yet there was no general demoralization, and confidence was not seriously impaired. In some parts of the country heavy investments were made during that very time in new manufacturing enterprises. The finances of the country were not deranged, and capitalists shrewdly argued that we were merely taking breath after severe exertion, which would be followed in due time by another forward movement. This came in 1886 and 1887, and those who had prepared for it reaped their justly earned profits. The country is again resting, and although prices have receded to rates still lower than those of 1884 and 1885, this is not an

unmixed evil and by no means does it portend universal bankruptcy in the iron trade.

It would be marvelous indeed if a condition of business would ever be realized in which failures would not occur until some calamity overwhelmed the entire trade. Such a peculiar state of affairs is not to be expected as long as business ventures are made with insufficient capital or at points possessing inferior resources, or by persons lacking some of the essential elements of successful management. A combination of unfortunate circumstances, such as the sudden curtailment of the demand, diminished prices and bad debts, may precipitate a failure independently of the causes just enumerated, but they will considerably hasten a failure if they are additional and cumulative. As the iron trade is now suffering from a reduced demand and low prices, there may be other establishments whose financial soundness and business management will be severely tested, and in some cases with disastrous results, but no considerable proportion of their number will be forced to the wall. The public should not accept the complaints of manufacturers about their unprofitable and unsatisfactory business as evidence of the unsound condition of the entire trade. Many establishments are even now fairly profitable, many others are making both ends meet with tolerable precision, and most of the remainder will be able to worry through this dull period without serious consequences to their financial backers.

Amendments to the Interstate Law.

One of the last official acts of President Cleveland was the signing of the bill amending the Interstate Commerce act. These amendments do not in any way change the principles underlying the original bill. They are intended rather to punish violations with more severity. It is provided that joint rates shall be published and otherwise considered the same as through rates. Such in effect they are, but some technical doubts about them have been raised which are now dismissed. Taken in connection with the recent decision of the commission, which practically calls every shipment a through one when a through bill of lading is issued, whether the through rate is prorated or merely a combination of locals, it is clear that every possible help is to be given toward extending the power of manufacturers and merchants to reach every city and hamlet by a through rate. This, indeed, is the basis of much of our modern trade, and the extension of the system as far as possible is in the line of progress. Then, reductions of rates must be preceded by three days' notice. Additional precautions are taken to secure to the commission the powers of the courts necessary to carrying out its work and its decrees.

The most important section of the amended law is the one relating to frauds, or what has become known as underbilling. That part of it which refers to shippers of freight we quote in full:

Any person and any officer or agent of any corporation or company who shall deliver property for transportation to any common carrier, subject to the provisions of this act, or for whom as consignor or consignee any such carrier shall transport property, who shall

knowingly and willfully, by false billing, false classification, false weighing, false representation of the contents of the package, or false report of weight, or by any other device or means, whether with or without the consent or connivance of the carrier, its agent or agents, obtain transportation for such property at less than the regular rates then established and in force on the line of transportation, shall be deemed guilty of fraud, which is hereby declared to be a misdemeanor, and shall, upon conviction thereof in any court of the United States of competent jurisdiction within the district in which such offense was committed, be subject for each offense to a fine of not exceeding \$5000 or imprisonment in the penitentiary for a term of not exceeding two years, or both, in the discretion of the court.

If any such person, or any officer or agent of any such corporation or company, shall, by payment of money or other thing of value, solicitation, or otherwise, induce any common carrier subject to the provisions of this act, or any of its officers or agents, to discriminate unjustly in his, its, or their favor as against any other consignor or consignee in the transportation of property, or shall aid or abet any common carrier in an such unjust discrimination, such person, or such officer or agent of such corporation or company, shall be deemed guilty of a misdemeanor, and shall, upon conviction thereof in any court of the United States of competent jurisdiction within the district in which such offense was committed, be subject to a fine of not exceeding \$5000, or imprisonment in the penitentiary for a term of not exceeding two years, or both, in the discretion of the court, for each offense; and such person, corporation, or company shall also, together with said common carrier, be liable, jointly or severally, in an action on the case to be brought by any consignor or consignee discriminated against in any court of the United States of competent jurisdiction, for all damages caused by or resulting therefrom.

Another part of the same section provides the same penalties for any officer or employee of any railroad who shall by the same means cause an unjust discrimination to be made in rates between one shipper and another. We know from reports and investigations already made public that the state of things described in these sections had become common. And while it is fair that merchants should be condemned as well as railroad men, it should not be forgotten that the responsibility for the condition of things which demanded this legislation rests largely upon the carriers themselves. By special agreements with shippers in the past to carry certain articles below the regular tariffs by billing them under false weights or descriptions these competing railroad agents have urged upon shippers the very practices which the carriers have been denouncing, and thus fastened the objectionable underbilling upon the whole business community. In this as in so many other things in trade it is the most unscrupulous railroad agent or shipper who sets the standard for all the rest. It is this standard which it is the province of Government to regulate. The old idea that Government should let everything alone to regulate itself is not now followed. We have laws regulating the employment of children and the compulsory stoppage of work on Sundays, for example. If these were left to conscience any single manufacturer or dealer who should hire only children or work Sundays could soon compel every competitor to do the same. Thus we find Government regulating, not competition, but rather the conditions under which competition shall be carried on. So in the matter of underbilling.

We have no doubt that the new law will in the end be beneficial, though it may at

first work disturbance in those lines where business had settled down under the old system of getting a low rate because everybody else did and carriers contracted to give it. If the classification upon any article is too high, or if the tariff rate from any part of the country to any other part is so great as to be prohibitory, let the fact become known and let proper measures be taken for bringing about a change. In the interest of good business this is better than to meet one wrong by another or to disguise the shipment. In this matter of false representation and consequent cut rates the merchant who attempts to defraud is more easily detected than the carrier who underbills to give some shipper an advantage. But under the law we expect to see justice done to all parties concerned.

Protection of Maritime Commerce.

England relaxes no effort in her ambition to surpass all other powers in the strength of her naval armament. Increased expenditure by rivals for the same end operates as an incentive on her part to redoubled exertion. She realizes the preponderance of her maritime commerce as compared with that of other nationalities, and that just here is her most vulnerable point, to be guarded at any cost. The subject acquires a fresh interest just now in Great Britain from the fact that Lord Brassey, a recognized authority in naval affairs, a few days ago addressed a meeting held under the auspices of the London Chamber of Commerce—with any number of admirals and members of Parliament among his auditors—at which he sought to demonstrate the present insufficiency of the British navy and the necessity of more liberal expenditures upon this arm of the national defense. He pointed out that other powers less exposed on the open sea in case of hostilities would be enabled to employ their entire available force in offensive warfare. For this reason, therefore, the Admiralty in past experience have found it of the first importance to "seal up" the enemy by a blockade, keeping watch in the offing, thus limiting the power for mischief, rather than attempt to protect 40,000 ships and upward of 9,000,000 of tons scattered all over the world. But blockading service is more arduous than before the days of steam, as pointed out by Admiral Hornby in a supplementary speech, the modern blockading force being a constant consumer of coal, and consequently unable to keep continuously at sea. This fact makes needful an adequate auxiliary force in reserve.

These united arguments in favor of increased expenditure, deemed imperative to insure the continued naval supremacy of England, were made conclusive by a comparison with France and Russia. It was shown by a tabular statement that within the last 26 years England has expended in the construction of new vessels fully \$250,000,000, while France expended for like purposes \$162,000,000, and that in the present year the difference against France is nearly as three to two. Despite this present and prospective preponderance in favor of England, Lord Brassey declared that so far from being satisfied, the rate of augmentation "ought to be four to two," a sentiment that was warmly applauded. All efforts, the speaker contended, should

be concentrated on "the finest and fastest vessels the constructors of the period could produce." He emphasized the value of unarmed cruisers and expressed special satisfaction with the assistance to be obtained from the mercantile marine for its own protection. All the leading mercantile powers—Italy, Germany, the United States and France—have given liberal encouragement to the building of steamships capable of conversion into fast-sailing cruisers. Admiral Hornby, whose magnificent views of the requirements of the British navy have excited much remark, not only concurred in the demands of his predecessor, but insisted that at least 300 cruisers would be wanted at the outbreak of war.

Naval authorities at Washington will doubtless take note of proceedings in London and govern themselves accordingly. A practical hint is conveyed by the expression of one of England's best naval authorities to the effect that the *furor* that accompanied the introduction of iron-clads and armored fleets is being succeeded by a wholesome reaction, and that swift cruisers, comparatively unprotected, constitute, in fact, the right arm of the national defense. Herein we find a tacit recognition of principles that are fully accepted in the practice of the Naval Board of the United States. At the same time, heavy armaments, dynamite guns, torpedoes and kindred warlike appliances all have their appropriate place. To provide plants on a scale commensurate with the demands of modern warfare must for years to come tax the best energies of all leading commercial powers. The United States cannot afford to pose as an indifferent observer of events.

The Blast Furnaces March 1.

As will be seen from the details given below, the capacity in blast has slightly increased, although there has been a falling off both in the anthracite and in the charcoal plants. This is due to an increase in the capacity of the coke furnaces. Although the number has not been greater, the output has been somewhat heavier.

On the first of the month the status of the anthracite furnaces was:

Anthracite Furnaces March 1.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New York.....	24	11	3,286	13	3,702
New Jersey.....	13	5	2,183	8	2,382
Spiegel.....	3	3	220	0	0
Pennsylvania:					
Lehigh Valley....	44	24	8,739	20	6,707
Spiegel.....	1	1	70	0	0
Schuylkill Valley..	38	24	8,916	14	4,120
U. S. Susquehanna Valley	17	11	3,642	6	1,256
Lebanon Valley....	16	13	6,307	3	1,193
U. S. Susquehanna Valley	22	11	4,555	11	3,420
Total.....	178	103	37,937	75	20,880

For a year past our records show the following:

	Furnaces in blast.	Capacity per week.
March 1.....	103	37,937
February 1.....	107	39,187
January 1, 1889.....	107	38,728
December 1, 1888.....	99	34,879
November 1.....	95	33,645
October 1.....	95	33,728
September 1.....	92	33,541
August 1.....	93	33,397
July 1.....	92	32,478
June 1.....	99	32,418
May 1.....	96	31,003
April 1.....	94	30,496

March 1.....	98	28,596
February 1.....	97	29,969
January 1.....	118	38,206

There have been no changes in New York or New Jersey. In the Lehigh Valley Crane is now running four out of five, Thomas eight out of twelve, Bethlehem two out of seven, Glendon two out of five, Coplay one of three and Lehigh both. In the Schuylkill Valley Norristown and No. 3 Phoenix blew in during February, while Merion went out. No change is reported from the Upper Susquehanna or from the Lebanon Valley, while in the Lower Susquehanna Valley one of the Chickies furnaces went out for repairs and improvements. Montour went out on the 2d.

The month opened with the following coke furnaces in blast:

Coke Furnaces March 1.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New York.....	3	1	1,144	2	2,300
Pennsylvania:					
Pittsburgh district.....	18	18	21,695	0	0
Spiegel.....	1	1	556	0	0
Shenango Valley..	19	15	10,422	4	2,806
Juniata and Conemaugh Valley.	18	11	5,906	7	2,480
Spiegel.....	1	0	0	1	430
Youghi. Valley....	5	4	1,625	1	600
Miscellaneous.....	4	3	1,688	1	650
Maryland.....	2	0	0	2	370
West Virginia.....	6	3	2,715	3	588
Ohio:					
Mahoning Valley..	14	11	9,002	3	2,517
Central and Northern.	18	12	8,451	6	4,604
Hocking Valley....	14	6	1,778	8	3,038
Hanging Rock.....	13	8	1,927	5	1,210
Indiana.....	2	2	481	0	0
Illinois.....	12	7	8,772	5	4,318
Spiegel.....	1	1	730	0	0
Wisconsin.....	3	2	1,085	1	500
Missouri.....	6	2	1,135	4	1,560
Colorado.....	2	1	490	1	450
The South:					
Virginia.....	12	9	4,021	3	2,117
Kentucky.....	4	4	1,290	0	0
Alabama.....	22	18	10,543	4	1,850
Tennessee.....	11	10	4,854	1	290
Georgia.....	2	1	501	1	275
Total.....	213	150	100,757	63	32,708

As compared with previous months, these figures stand as follows:

	No. of furnaces.	Capacity per week.
March 1.....	150	101,737
February 1.....	150	98,518
January 1, 1889.....	157	103,720
December 1, 1888.....	151	101,748
November 1.....	146	94,695
October 1.....	137	85,481
September 1.....	133	81,082
August 1.....	122	74,355
July 1.....	121	69,543
June 1.....	128	75,427
May 1.....	130	75,815
April 1.....	128	70,644
March 1.....	128	68,892
February 1.....	126	73,912
January 1.....	143	83,101

In the Pittsburgh district all the furnaces are active. Clinton, operated by a syndicate of creditors of Graff, Bennett & Co., is again working. Laughlin & Co. have reconsidered their plan of tearing down their two old furnaces, having repaired and started one of them. The other has been dismantled. This increases the number of furnaces in Allegheny County to 19. The new Carrie is rapidly approaching completion, and will be ready not later than May 1. We may note that the output of the two Isabellas for February was the largest in their history, being close upon 3000 tons per week for both. Soho, too, made a good record for a new furnace.

Nothing is reported from the Shenango, Juniata and Conemaugh or Youghiogheny valleys, except that Charlotte was banked for a few days for repairs. In Maryland Catoctin, which was banked during February, was blown in. The West Virginia furnaces are making good records, their aggregate February product being 10,860 gross tons. In the Mahoning Valley Thomas resumed on the

27th ultimo, and Girard lost 10 days to make repairs. In the Hocking Valley Glasgow and Floodwood are out, leaving only Akron, Bessie, Crafts, Fannie, New York and Winona at work. Among the other Ohio furnaces no changes have taken place. The Illinois furnaces produced in February 88,009 gross tons, including spiegel, against 53,494 tons in January, the decrease, of course, being due to the stoppage of the Union plant.

The only facts worthy of recording in connection with the Southern pig iron producers are that the new No. 2 North Birmingham furnace, of the Sloss Company, blew in the 12th ultimo, and that Bibb stopped work. In the near future the second De Bardeleben, the fourth Ensley and the Trussville furnaces will be added to the list, the latter awaiting only the laying of the sidings. Sheffield, too, expects to see some of its completed stacks make their first cast at an early date. In Kentucky the second Ashland started on the 20th ultimo.

The condition of the charcoal furnaces was as follows:

Charcoal Furnaces March 1.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New England.....	14	8	605	6	495
New York.....	10	2	272	8	680
Pennsylvania.....	23	2	115	21	950
Maryland.....	8	4	389	4	250
Virginia.....	23	0	0	23	943
West Virginia.....	3	0	0	3	165
Ohio.....	18	5	378	13	902
Kentucky.....	2	1	80	1	75
North Carolina.....	2	1	70	1	70
Tennessee.....	9	3	725	6	1,205
Georgia.....	2	1	60	1	54
Alabama.....	10	8	1,670	2	470
Michigan.....	25	11	3,841	14	3,370
Minnesota.....	1	0	0	1	180
Missouri.....	3	2	562	1	150
Wisconsin.....	10	4	1,595	6	810
Texas.....	1	1	176	0	0
California.....	1	0	0	1	210
Washington Ter....	1	1	270	0	0
Oregon.....	1	1	275	0	0
Total March 1.....	167	55	11,081	112	10,981
Total Feb. 1.....	167	62	11,219	105	10,406
Total Jan. 1.....	169	67	11,946	102	9,822
Total Dec. 1.....	169	71	12,288	98	9,397
Total Nov. 1.....	169	73	12,724	96	8,941
Total Oct. 1.....	175	71	11,619	104	9,088
Total Sept. 1.....	178	67	11,243	109	10,004
Total Aug. 1.....	178	65	11,187	111	10,096

In New York Copake was to blow in again on the 10th inst. In Pennsylvania Mont Alto is still repairing, but will soon resume, and Pine Grove is expected to be ready for work early next month. In Virginia all the furnaces are idle. Walton and White Rock are, however, now getting ready for a blast. In Kentucky Bellefonte has probably stopped producing at this writing. In the Hanging Rock Region Bloom and Mount Vernon are getting ready. Jefferson will be out of blast at least three months for lack of charcoal. Michigan furnaces did well in February, making a total of 15,365 gross tons, as compared with 15,906 tons in January. Hinkle and Minneapolis continue to do good work in Wisconsin. In the South Gadsden is to start this month and Round Mountain reported that it would resume on the 4th inst.

The Warren Tube Works, at Warren, Ohio, which cost \$250,000 to erect three years ago, were on Tuesday appraised at \$30,000, and will be offered at sheriff's sale April 13. The sheriff on Tuesday levied on the property of the Lewisburg Nail Works, at Lewisburg, Pa., on execution issued on judgments confessed on the company's paper, amounting to \$32,000. Most of the indorsers are the directors of the company, and they took this step to save themselves as far as possible. There is also a mortgage of \$35,000 on the plant. The works were shut down.

CORRESPONDENCE.

Ball Bearings.

To the Editor: I notice in *The Iron Age* of February 21 an old acquaintance, "Ball Bearings," whom I supposed had departed from active life years ago. I believe its introduction to the mechanical world came partly through the writer by assisting in its adaptation to certain purposes, but without any claim to its invention, that being due to Mr. Kirk, who designed it for the reduction of friction upon the axles of light carriages. A full account of it and of its application to several steamers built at Philadelphia for taking the thrust of propeller shafts will be found in a communication to the *Artisan*, March number, 1856, published in London. This plan was also applied to take the weight of cranes in a large machine shop in this city previous to its publication in the *Artisan* and subsequently to the support of rudders in large ships. No doubt Mr. Grant's designs are original with him, but the many years which have elapsed since their first application to the identical purpose named by him is another example of the Scriptural aphorism, "There is no new thing under the sun." W. J.

PHILADELPHIA, March 6.

Our correspondent, who is a very widely known mechanical engineer, does not, we believe, appreciate quite correctly the motive which led *The Iron Age* to publish Mr. Grant's designs for ball bearings. In the majority of cases probably their application will not be claimed to be new. The leading point in our estimation was the fact that through the development of the Simonds machine the cost of manufacturing true balls for bearings has been so much reduced that their introduction has been made far more widely possible. In order to demonstrate what may be accomplished by the use of ball bearings, we expect shortly to illustrate a machine intended for unusually heavy work and the durability of which has been greatly increased by the introduction of ball bearings throughout. While reducing the wear and tear, it does the same work it formerly did with less power.

The Economy of Recuperative Gas Heating Furnaces.

To the Editor: The Ajax Forge Company, of Chicago, have at their works two of my recuperative gas heating furnaces, one running since November, 1887, in connection with a train of rolls and other machinery, and is heating rails in lengths of 2 feet to 5 feet; the other is running in connection with a steam hammer in front and a power-former on one side of it, and is heating car axles or piles of scrap for the hammer and sometimes rail sections for both machines. The work-chamber of these furnaces is accessible from three sides, and the new furnace has doors in front and one side. To each furnace is attached a vertical tubular boiler 4 x 10 feet with fire-box, forming the lower part of the stack. Both furnaces run day and night, and the steam made in these boilers is run into the main steam-pipe to help run the machinery of the works.

The rail furnace has to heat 28,000 pounds of rails, the capacity of the machinery, from cold to bright yellow in 22 hours or 1270 pounds in one hour, and consumes every 24 hours 6000 pounds of Illinois coal, or 250 pounds per hour. It has a hearth of 7 feet 6 inches by 5 feet 3 inches, with three doors. One of these is used for drawing while another is being charged. No cold

air enters the doors to chill the hearth and oxidize the charge; the shrinkage of metal due to heating is 2 per cent. Recently the amount of water evaporated by the rail-furnace boiler was measured by meter and found to be 347 cubic feet per 25 hours, or 868 pounds for one hour. An ordinary tubular boiler, evaporating at a rate of 8½ pounds of water from and at 212° per pound of Illinois coal, would require 124 pounds of coal to evaporate those 868 pounds of water from 50° to steam of 70 pounds pressure. In comparing the efficiency of this furnace with that of furnaces which do not furnish steam, these 124 pounds of coal have to be deducted from the total amount of 250 pounds, leaving 126 pounds of coal for heating purposes, which is equivalent to 198 pounds of Illinois coal per ton of rails heated from cold to bright yellow, the waste being 2 per cent. This every-day practice is considerably below the capacity of the furnace and the effectiveness of the system, because

1. The work of the furnace is limited by the capacity of the machinery; it has heated at the rate of 48 pounds of rails per square foot of hearth per hour and can do more.

2. The recuperator of the furnace is limited in size, on account of the mill floor being low down on the water in the ground.

3. The capacity of the vertical boiler (put up to economize space) is too small, as shown by the heat escaping from the top of the flues.

The new hammer furnace works quick and hot; it heats two car axles in one open door to soft white heat in 15 minutes—regular time, 20 minutes—with a shrinkage of metal equal to 2 per cent.; it will also heat 10 piles of 150 pounds each in 25 minutes—regular time, 30 minutes. These furnaces work with a continuous flame (no reversing) and occupy but little more space than ordinary heating furnaces. They can be built of any size and to suit special purposes.

Respectfully yours,

JOHN ZELLWEGER.

162 LA SALLE STREET, CHICAGO, ILL.

The Metal Exchange and Pig Iron Warrants.

To the Editor: The very interesting discussion which has for the last few weeks been carried on in your columns anent the newly established company for storing pig iron on warrants, and especially the thoughtful letter from Mr. Hull, as published in *The Iron Age* of February 8, prompts me to say a word or two on behalf of the members of the New York Metal Exchange, who naturally look upon this new departure with much interest. We believe that to encourage speculation in great commodities of trade is a good thing, not only in systematizing the speculation which will inevitably exist as one of the impulses of human nature, and removing many of the elements of unnecessary risk, but also and perhaps even more, by relieving those who manufacture, consume or deal in a given commodity for such a profit as represents only the legitimate reward of their industry and return on their capital from the necessity of taking speculative chances of price, under which they lie when there is no distinct class of speculators to assume these risks.

But apart entirely from the ethics, as it were, of speculation as ordinarily incident to a warrant system of storage, it seems almost incredible that any one should dispute for a moment the benefits of a large stock of goods in moderating the violence of fluctuations, and the danger to trade in the absence of such a stock; and even more incredible that speculators should have failed to grasp the abnormal position of iron in this respect. It is as if a great city

like New York should depend for its water supply on the casual flow of streams in its vicinity, without providing by means of reservoirs for such a reserve as would supplement the natural sources in the event of drought or meet an unexpected consumption as the result of sudden activity in factories using water or a spell of warm weather that would increase the demand for drinking and bathing purposes. If we can imagine a community so imprudent as to place themselves in such a predicament, we can readily picture their sad plight in case of need and the eager competition of capital to control the few days' supply of water that would be available under such circumstances.

Yet precisely a similar condition exists in regard to iron to-day, and the many industries dependent upon that useful metal are at the mercy of the purely speculative elements of the country, which may at any moment seize upon and corner every pound of iron available for immediate needs, with a very small expenditure of capital. Or the article may actually corner itself in case of a marked revival of consumption, just as happened in the early months of 1879. At that time, or at the beginning of that year, the furnaces had on their hands unsold but 126,000 tons of iron, and stocks in second hands had become so far reduced as to be altogether inadequate to meet the extraordinary demand which then sprung up with the revival of trade. The inevitable result was a "boom" of colossal proportions, whose disastrous collapse has led every one to dread a repetition. The few speculators who were shrewd enough to grasp the situation at the proper time made money, but the net result to those actually engaged in the production or use of iron was a serious loss.

How near we are to a similar experience may be readily seen when we consider that although the actual stock in sight is larger now than it was nine years ago, the proportion to annual output is a trifle less, being 4½ per cent. at the end of 1879, and only 4⅓ per cent. of the production at the end of 1888, while the stocks which are not held by the furnaces are even smaller now than then and the current price is hardly \$1 per ton higher. Contrast this showing with that in Great Britain and we may judge how weak are our safeguards as compared with those which have been accorded by the use of the warrant system abroad. Cozmal's stores have for years contained an amount of iron never less than 70 cent. of all the iron produced in Scotland annually, and at present hold over 1,000,000 tons, just about as much as was made during 1888. The various stocks which can be traced through England and Scotland aggregate over 2,000,000 tons, or seven times as much as the reserve held in this country, although the British annual production averages not more than 500,000 tons above the American, the respective figures being 7,500,000 to 8,500,000 tons and 6,000,000 to 6,500,000 or 7,000,000.

The results are very apparent. While our prices are ranging from \$17 to \$25, the extremes in foreign quotations are rarely more than \$2 a ton apart. At the time of the boom of 1879-80 we saw an advance of \$25 and a decline of \$20 inside of 18 months; but the highest price in the Scotch market was only \$8 above the lowest during this period, although the wild fluctuation in our market had a strong effect on the foreign one. Our permanent range of price is higher than that in Glasgow and Middlesboro' for a variety of reasons, but English and Scotch ironmasters enjoy a steady market, from which they can in the long run be more certain of a remunerative business than our own furnacemen, who are strangers to any condition of affairs other than a hand-to-mouth dependence on the changes of the market. For this regularity of trade the foreign

makers are chiefly indebted to the reaction upon one another of systematic speculation and the warrant system that prevails in a number of the British iron centers. The speculators not only allay extreme fluctuations by their readiness to buy at each decline or sell out whenever a slight rise shows them a small profit, the many interests involved constantly operating as a check upon each other; but the speculative contingent also serves another purpose in the new capital which it attracts to investment in iron, creating, as it were, a new kind of consumption, which absorbs the increased stocks brought into being by the warrant system. Without the latter there will still be speculation, but it will be of the hurtful kind that aggravated the natural corner of 1879; and it is of this kind that we stand in danger to-day. For there cannot well be imagined a more likely chance for making a large sum of money than for a few gamblers in the public necessity to buy up the ridiculously small supply of iron in sight, and hold the iron trade at their mercy. At the first sign of a rapid growth in consumption, such as is sure to come sooner or later, we may depend upon it that the opportunity will be availed of; for there is not a single commodity of importance in which there is such a paucity of reserve to act as a balance-wheel upon prices as is the case with iron. Rarely less than 25 per cent. of the year's crop of wheat, corn, cotton or coffee is carried in stock; but our stock of iron is no larger than it was when we produced annually three-fourths of our present output; is one-seventh that carried by a country possessing but a slightly larger trade, and is, as Mr. Hull has already pointed out, barely sufficient to meet the absolute needs of the people if our furnaces were to simultaneously shut off their blast for a single fortnight.

This is a dangerous situation for all except the men who may hope to be successful in the eventual speculation, and it behooves the really conservative element of the trade to carefully consider the fact that the stock of iron grows steadily less in proportion to the need for it, and to do their best to remedy this by lending a cordial support to any measures that will encourage the accumulation of a suitable reserve.

TALLMADGE DELAFIELD,
President New York Metal Exchange.
NEW YORK, March 8.

John Ericsson.

This illustrious engineer was born July 31, 1803, in the province of Wermland, Sweden. He died in this city on Thursday night last. The accompanying engraving, for which we are indebted to *Harper's Weekly*, is pronounced by his secretary, S. W. Taylor, to be the best portrait. His father, Olof Ericsson, was proprietor of mines, his mother, Sophie, being the daughter of an iron-master. Nils, John Ericsson's elder brother, rose to be baron, colonel of engineers, chief of the state railways, and with his three sons sat in the Swedish Diet. At the age of 10 John Ericsson constructed a miniature sawmill and a pumping machine that attracted the notice of Count Platen, chief of the great ship canal intersecting the Swedish peninsula. At 12 the youthful contriver was made a cadet of mechanical engineers; the following year a leveler on the canal. At 17 Ericsson entered the army as ensign and rapidly reached a lieutenantancy in consequence of his beautiful military maps, which had attracted the special attention of King Charles John (Bernadotte).

When about 22 years old Lieutenant Ericsson constructed a flame engine of 10 horse-power, and journeyed to London in 1826, on leave, to introduce it. Once

there he resigned his commission. The resignation was accepted, but first he was promoted to a captaincy. He has never returned to his native country, but from it has received many honors and decorations, while in 1867 a great granite monument, quarried by the unpaid labor of the miners, some of whom had worked for his father, was set up with gala festivities in front of his mansion, inscribed "John Ericsson was born here in 1803."

During the next few years in England Ericsson produced about 40 machines, of which a third were patented. They included a file-cutting device, an instrument for taking soundings (still in use), a hydrostatic weighing-machine, an apparatus for making salt from brine, a pumping engine, a rotary steam engine and a famous system of artificial draft for steam boilers, dispensing with huge smoke-stacks and economizing fuel. To the steamship *Victory*, in 1828, he applied the principle of condensing steam and returning the water to the boiler; and four years later he gave to the *Corsair* the centrifugal fan-blowers now generally used in American steam vessels. In 1830 he introduced in the locomotives *King William* and *Adelaide* the link motion for reversing steam-engines. In 1834 he superheated steam in an engine on the *Regent's Canal Basin*.

In 1829 the Liverpool and Manchester Railway had offered a prize for competing locomotives. Ericsson planned and hurried to completion an engine, the *Novelty*, in seven weeks. The *London Times* of October 8, 1829, said that in speed it "far excelled" all competitors; that "it was the lightest and most elegant carriage on the road yesterday, and the velocity with which it moved surprised and amazed every beholder. It shot along the line at the amazing rate of 30 miles an hour." But Stephenson's *Rocket* proved superior in point of traction. "In locomotive engineering," wrote John Bourne nearly half a century later, "nothing more original or more elegant has been produced than the *Novelty*." Ericsson in 1829, nearly three-score years ago, constructed a steam fire-engine employed in putting out a fire in the Argyle Rooms. Another the next year guarded the Liverpool docks; a third was sent to Berlin. Ten years later, in 1840, the Mechanic's Institute of New York gave its large gold medal to Ericsson for the best system of fire-engines.

His famous caloric engine was produced in 1833. The scientific world of London hailed it with astonishment. Lardner, Ure, Faraday and Sir R. Phillips gave special attention to it. The high temperature evolved prevented that first machine from becoming practical, while 20 years later, in 1853, a voyage of the caloric ship *Ericsson*, a vessel of 2000 tons, 260 feet long, from New York to Washington and back, showed that, though economical in fuel, the new heated air motor could not produce speed enough at sea for commercial purposes, nor compete on any large scale with steam. Still it has been applied successfully in more than 6000 engines to minor useful purposes—pumping, printing, hoisting, grinding, telegraph instruments, sewing-machines, and so on. The American Academy of Arts and Sciences awarded the gold and silver medals of the Rumford premium to Ericsson "for his improvements in the arrangement of heat, particularly as shown in his caloric engines of 1858." This was the second bestowal of the Rumford medal in this country.

But we go back now to chronological order, and come upon that device of supreme importance, the screw propeller. In 1837 Ericsson built a tug, 40 x 80 feet, with 3 feet draught, having two propellers of 5½ feet diameter, invited the British Admiralty to inspect it, and towed their barge at a rapid rate; but their lordships solemnly concluded that as the motive power was in the stern the novel

craft would not steer! Ericsson in 1839 came to America and in 1841 began to build the *Princeton*, the first naval vessel that ever carried her machinery under the water-line, out of the reach of hostile shot. This vessel dictated reconstruction to the fleets of the world. The *Princeton* included other inventions of Ericsson—a direct-acting steam engine of unusual compactness; a telescope smokestack, in place of the tall ordinary pipe; a centrifugal blower in the hold; a gun carriage with machinery for taking up the recoil, the self-acting lock allowing the gun to be fired accurately. The *London Mechanics' Magazine* has said: "The undivided honors of having built the first practical screw steamer, the first screw war ship, the first cupola (turret) vessel, belong to John Ericsson."

To this first turret vessel we now come. Such a device had been offered by Ericsson in 1854 to Napoleon III, and in the fall of 1861 he proposed it to our Navy Department. By extraordinary energy and executive skill the *Monitor* was launched, with steam machinery complete, 100 days from the laying of the keel plate, and arrived in Hampton Roads just in time to defeat, March 9, 1862, the Confederate iron-clad *Merrimac*, which had destroyed the *Cumberland* and Congress and was about to sink or disperse the rest of the Government's wooden fleet. But for the *Monitor* the whole face of the war might have been changed and European interference attempted.

A fleet of iron-clad vessels of the *Monitor* type was built with extraordinary rapidity after the victory at Hampton Roads. Six of them, in Charleston Harbor, within 52 days, were struck by hostile shots an aggregate of 629 times without one penetration of side armor, turret or pilot-house. The *Weehawken* defeated and captured the Confederate ram *Atlanta*, and the *Montauk* destroyed the *Nashville*. In 1864 the monitors captured the ram *Tennessee*. Russia, Sweden, Norway and Turkey adopted the American turret system, and when the *Miantonomoh* crossed the ocean even the British construction yielded, and carried it out on a far larger scale. During the last years of his life Ericsson proposed, for defensive war, to destroy the tremendous naval structures his system caused to be built up. His last iron vessel, 180 feet long, carried a submarine 16-inch gun 30 feet long, to discharge a projectile weighing 1500 pounds, and containing 300 pounds of gun-cotton, against an ironclad's hull, beneath the customary water-line armor belt, with such effect that water-tight compartments would be of no avail. As Ericsson called his locomotive *Novelty* and his impregnable battery *Monitor*, so he called this latter creation *Destroyer*.

The variety of Captain Ericsson's work was only less remarkable than its intrinsic importance. In 1851, at the London World's Fair, he exhibited an instrument for measuring distances at sea; a hydrostatic gauge for fluids under pressure; a gauge for the volume of water passing through pipes; the alarm barometer; a pyrometer; a measure for fluids by the velocity with which they pass through definite apertures; a sea-lead for use without rounding the vessel to the wind. His contributions to the Centennial Exhibition of 1876 are described in a volume of 600 quarto pages. Among his scientific investigations were remarkable computations of the influences tending to retard the earth's rotary motion, including the weight of material taken from below the earth's crust and piled above it by the hand of man.

Favored by the possession of a robust constitution and ample means, Ericsson was able to devote many years exclusively to the investigation of solar heat, and to the determination of the mechanical energy which the great luminary has in store for

mankind when the coal fields become exhausted. A sun motor, illustrated in "Nature," vol. xxix., page 217, was erected by the experienced engineer 1883 on his premises in Beach street.

The Reading Failure.

A meeting of the creditors of the Reading Iron Works was held at the office of the company in Philadelphia recently. George F. Baer, a director of the company and also its counsel, read a statement of the financial condition of the corporation, which showed the total liabilities to be \$1,927,783.22 and assets \$2,439,595.09. It was agreed to appoint a committee of three to conduct the mills temporarily. On this committee the company and the creditors were represented, the former by the appointment of Director Simon Seyfert and the latter by Mr. F. Patterson, a heavy creditor. F. W. Swink, the general manager of the works at Reading, was the other member chosen. The committee will continue in control for the time being, and in the meantime a careful appraisal of the assets will be made. For this purpose a second committee of five was named, and upon this the creditors and the company were given representation. The members of the committee are John Cole, of New York; John H. Hagan, of Philadelphia, a prominent iron man; R. McIlvaine, of Reading; William Frich and Albert Foster, of the Philadelphia and Reading Railroad Company. Another committee will go to work at once and prepare a plan of reorganization. This committee will report at a meeting to be held on Thursday, if possible, or if not then at a meeting the date for which will then be agreed upon. The members of the committee are all bankers and are as follows: President Rogers, of the Traders' Bank; E. T. Clark, Edward H. Nichols and Peter Hollis. A statement of the assets and liabilities is as follows:

Assets.

Real estate—tube works plant....	\$406,772.88
Rolling mill.....	88,000.00
Furnaces.....	318,750.43
Scott foundry.....	357,728.13
Sheet mill.....	206,573.11
Steam forge.....	107,700.00
Ice machine plant.....	4,214.99
Iron ore, leasehold and fixtures...	23,985.09
Gibraltar Iron Works.....	64,137.13
Camden Tool and Tube Works....	35,000.00
Water-works, Reading.....	17,700.00
Limestone quarry.....	6,500.00
Scarborough land.....	2,068.50
Jenkins purchase.....	4,076.36
Indian real land, Kansas.....	1,732.36
Bedford coal land.....	5,000.00
Hartford ore land and fixtures....	2,717.42
Geo. Russell, real estate.....	400.00
Real estate & dwellings, Reading	45,600.00
Lehigh avenue real estate.....	100,000.00
Sundry real estate.....	11,850.00
Boone property.....	1,538.68
Wm. Crouse property.....	429.00
Chester land.....	26,575.50
Stocks, bonds and mortgages.....	47,293.25
Materials, goods and supplies at works.....	252,392.30
Work on two cotton presses.....	30,000.00
Stock in warehouse.....	98,406.50
Book accounts due to company, general.....	65,581.20
Book accounts due to company, warehouse.....	70,118.98
Bills receivable.....	8,145.76
Cash.....	19,603.32
Total.....	\$2,439,595.09

Liabilities.

First mortgage issue.....	\$590,000.00
First mortgage held for hunter dower.....	10,000.00
Bills payable.....	630,790.69
Open accounts due by company, general.....	194,059.71
Open accounts due by company, warehouse.....	28,240.53
Loans.....	170,000.00
Indorsements on bills received on unfilled orders.....	287,692.29
Wages unpaid.....	11,000.00
Total.....	\$1,927,783.22
Leaving a balance of assets of....	501,811.87

The above statement does not take into account in the liability column the capital stock of the company, which amounts to \$1,050,000, consisting of \$550,000 in preferred stock, which was issued in 1884 to the creditors in the failure of the company in 1881, and on which 7 per cent. interest has been paid, and \$500,000 in common stock. Adding this capital stock to the liability account would leave an apparent deficit of \$548,188.13. The report of the committee appointed to make

sels would also suffer. The blockade of the American coast by a German fleet would soon arouse England and France, as cutting off their trade would very speedily draw those powers into antagonism. The advantage of the Samoan troubles if they go no further will be to show the necessity of a greater activity in rebuilding the navy.

In connection with his researches, Admiral Porter has prepared the following exhibit of the ships of the German navy:

Name	Crew.	Speed.	Tons.	Battery— No.	Caliber.	When built.
Preussen and Friedrichder.....	587	14	6770	4	10.25	1873
Grosse.....	...	...	...	2	6.70	...
Kaiser and Deutschland.....	638	14.6	7678	8	10.25	1874
Sachsen Bayern Wurttemberg and Baden.	354	14	7400	4	10.25	1873-86
Oldenburg.....	...	14	5306	6	11.75	1881
Hausa*.....	397	12	3810	8	8.25	1872
ARMORED GUNBOATS:						
Viper†.....	76	9	1109	1	12.00	1876
UNARMORED CRUISERS:						
Freya*.....	248	15	2017	8	5.91	1874
Leipzig and Prinz Adelbert.....	432	16	3625	11	6.70	1876
Bismarck‡.....	404	14	2866	16	5.91	1877
Carola §.....	267	14	2169	8	5.91	1880
Alexandra I.....	267	14	2370	12	5.91	1885
Ariadne and Lluse*.....	238	14	1719	6	5.91	1871-72
Blitz and Pfeil.....	127	16	1382	1	4.72	1882
Albatross.....	115	12	716	2	4.72	1871
Nautilus... ..	115	10.6	716	2	4.72	1871
Cyclop.....	67	8	412	2	3.15	1874
Wolf, Hyaene and Iltis.....	87	11	489	2	4.72	1878
Zieten.....	111	16	975	4	3.15	1876
Hobicht and Möwe.....	127	10.5	648	1	5.91	1879
Adler.....	...	10.3	833	1	5.91	1889

* Wood. † Sister ships to the Viper: Weepe, Biene, Scorpion, Muecke, Basilisk, Cameleon, Crocodile, Natter, Salamander and Hummel. ‡ Sister ships to Bismarck: Blucker, Stosch, Moltke, Gueisanan (1879), and Stein (1879), with two more of improved type building in 1885. § Sister ships to Carola: Olga, Maria and Sophia. † Building in 1885 two sister ships not yet named to replace Nympe and Medusa (of same class as the Alexandra).

an appraisement may change somewhat the figures in the asset column, as those given are taken from the books of the company, which are based on the original cost price.

Washington News.

(From Our Regular Correspondent.)

WASHINGTON, D. C., March 12, 1889.

The possibilities of the Samoan situation will for some time allay any apprehension as to the surplus. The startling reports concerning the Nipsic were a subject of profound concern in administrative circles. The discrediting accounts since received have allayed the excitement somewhat, but the President and his counselors have considered the situation and its possibilities very carefully, and are ready to act promptly should the crisis come. At the Navy Department there is also much activity. The Government will await further information, and unless some overt act of hostility shall have been committed the Berlin conference will be permitted to run its course in the line of an amicable settlement if practicable. The most careful study of the situation and its possibilities from a naval standpoint has been given by Admiral Porter. He admits that the navy is not sufficiently strong to cope with the German ships at present, but the ability to build ships and plenty of them with ample resources of money and material is in our hands. The Admiral says that a fleet of fast privateers to prey upon German commerce could be fitted out in 60 days at an outlay of not over \$50,000,000. There are 600 German steamers afloat which would be destroyed or driven from the sea. The sailing ves-

The Government has issued orders to accelerate the work on the vessels now being constructed, and the new ships authorized will be hastened through the preliminaries and gotten under way as speedily as possible. The opinion of Senators and Representatives in the city is decidedly in favor of the most comprehensive measures to meet the emergency. If the Samoan controversy should necessitate an extra session, the building of ships and manufacture of materials of war would involve an outlay of fully \$200,000,000, a large share of which would be expended in steel and iron. The stimulus to activity in the metallurgical industries would be without precedent. By July 1 contracts will have been let increasing the navy by over 15,000 tons.

The Ordnance Department of the army is making very satisfactory progress on the proposed gun foundry at Watervliet Arsenal, West Troy, N. Y. The plans have been completed and advertisements for proposals to construct the buildings have been made public. The plans for the machinery have also been prepared. General Benet is in hopes of having the foundry in such a state of advancement that the work of manufacture of guns will begin at the earliest possible day. In the fortification bill for the fiscal year of 1889-90 is an item of \$35,000 for the assembling of guns, which was the amount asked by the Ordnance Department as all that will be required for the next year. General Benet says that the gun foundry at Watervliet will, in a very short time, be one of the finest establishments of the kind in the world.

Australia will contribute £35,000 annually toward new British war ships.

TRADE REPORT.

Chicago.

Office of *The Iron Age*, 96 and 97 Washington street, CHICAGO, March 11, 1889.

Pig Iron.—The volume of business is still shrinking. While some dealers continue to report a fair run of orders, others have been unable to sell more than a few carloads of Iron during the entire week. At the same time, there is a decided diminution in the pressure to sell by furnace companies. Some of them have disposed of so much of their anticipated product for the year that they are asking advanced prices, which, of course, takes them out of the market for the time being. Others are instructing their agents to solicit no more orders for future delivery, having adopted the policy of offering Iron only when they accumulate a stock of some grade for which they have no contracts. It is reported that one of the strongest furnace companies in the South, financially, will shortly blow out their furnaces and await the return of better prices. This indicates the feeling in that section. Lake Superior Charcoal is in but limited demand, yet prices are sustained. Cash quotations are as follows, f.o.b. Chicago: Lake Superior Coke, No. 1, \$16 @ \$16.50; No. 2, \$15 @ \$15.50; No. 3, \$14.50; Chicago Scotch, No. 1, \$17.50; Lake Superior Charcoal, Nos. 1 and 2, \$19.50; Nos. 3 to 6, \$20; American Scotch (Blackband), No. 1, \$18 @ \$19; Jackson County Silvery, No. 1, \$18 @ \$18.25; other Ohio Soft Irons, No. 1, \$17.25 @ \$17.50; Southern Coke, No. 1 Foundry, \$16.25 @ \$16.75; No. 2 Foundry and No. 1 Soft, \$15.75 @ \$16; No. 3 Foundry, \$15 @ \$15.50; Gray Forge and No. 2 Soft, \$14.50 @ \$14.75; Tennessee Charcoal, No. 1, \$19.

Bar Iron.—An improving demand is noted in some quarters, and there is a slight revival of Car work, with sales of small quantities for this purpose during the week. Prices are no higher, but, on the contrary, the market has been disturbed by reports of Iron of good quality being offered at rates far below anything hitherto considered necessary to effect sales. Carload lots of Good Common Iron are ordinarily quoted at 1.60¢ @ 1.62½¢, half extras, f.o.b. Chicago, but these prices are shaded for large lots or good specifications. Store prices still range from 1.80¢ to 2¢, according to quantity and quality.

Structural Iron.—So far as can be ascertained, no large orders were placed, but fair prices are now being made of small lots. Prices are unchanged.

Plates, Tubes, &c.—Dealers report a very fair week's business, but no orders were taken running above 25 to 50 ton lots. Plenty of work is still in sight, and the prospects are quite bright in this branch of the trade. Collections, however, are not so good as they should be. Quotations are unchanged.

Sheet Iron.—Jobbers are beginning to place their orders with manufacturers of Black Sheets for summer and fall delivery. The movement in this direction is unusually early, but they do not propose to get caught again as they were last fall. Manufacturers' prices range at about 2.90¢, f.o.b. Chicago, for No. 27 Common Black. Sales are being made from store at 3.10¢ @ 3.20¢ for No. 27, but trade is very light at present. Manufacturers' agents have had a very good week in Galvanized, mill orders being much larger than for several weeks, while warehouse stocks have also been drawn upon quite actively. Jobbers quote small lots at 65 % off for Juniata and 65 % and 2½ % off for Charcoal, but manu-

facturers' agents claim to be getting 62½ % and even 60 % for small lots of Juniata.

Merchant Steel.—Nothing new has occurred in this line. While prices are very low, they do not seem to attract consumers, and business is very dull. A leading Steel house notes as a curious feature of its February trade that the number of separate sales was much larger than for many months, while the aggregate tonnage was smaller than usual, indicating small stocks among its customers and their almost unanimous determination to buy only from hand to mouth. Quotations are unchanged.

Steel Rails.—The sales of the week have aggregated about 6000 tons, ranging from a 2000-ton order to a carload. While no improvement in the immediate demand can be noted, the manufacturers are feeling a little more cheerful over the prospect. Several deals are in progress, involving considerable quantities, and it is felt that as the season advances more Rails will certainly be needed by the railroads than they can now foresee. Quotations continue at \$30 @ \$30.50, according to quantity.

Railway Supplies.—More activity is reported now than at any time since the year opened. This is merely a comparative statement, however, as business is by no means good. Quite a large sale of Steel Splice Bars was made during the week, and a number of contracts were entered for Spikes and Bolts. Competition among the manufacturers is very keen, and the following quotations can probably be shaded on large lots: Splice Bars, 1.75¢; Spikes, 2¢; Bolts, with Hexagon Nuts, 2.65¢.

Old Rails.—The last sales of Old Iron Rails reported were made at \$21, but the quantity now to be had is very limited, and as holders are quite stiff in their views it is difficult to determine what the market price is at present. Although this would seem to warrant the expectation of higher prices, dealers are conservative, and the best posted are inclined to believe that no further advance will be made. Old Steel Rails are worth \$14.50 @ \$15 for short lengths; \$18 @ \$20 for long lengths or \$16.50 as they run. Old Car Wheels are variously quoted by dealers at \$18.50 @ \$19, but no transactions of consequence have transpired.

Scrap.—Old material is moving, but only in small quantities, consumers buying sparingly. The railroads are offering a great deal of Scrap at present, so that stock is abundant. An inquiry for a large lot of Mixed Steel is in the market, which is something novel. Mixed Country Scrap is worth \$13 @ \$14. Regular quotations to consumers are as follows, per ton of 2000 lb: No. 1 Railroad Shop, \$19 @ \$20; Mixed Track, \$18 @ \$19; Fish-Plates, \$21; No. 1 Mill, \$14 @ \$15; Pipes and Tubes, \$13 @ \$14; No. 2 Mill, \$9.50; Axles, \$25; Horseshoes, \$18 @ \$19; Machinery Cast, \$13; Stove Plate, \$10.50; Cast Borings, \$8.50; Wrought Turnings, \$11 @ \$12; Axle Turnings, \$13; Mixed Steel, \$10.50; Coil and Leaf Steel, \$15; Tires, \$15 @ \$16.

General Hardware.—Business in Shelf Hardware is not evenly distributed at present, some houses reporting a most excellent state of trade, while others note a decided falling off. Prices appear to be at a standstill. The manufacturers of the coarser classes of goods are inclined to curtail production, and with a little increase in the demand their prices would be decidedly firm. As to the jobbing trade, while there is very sharp competition in progress, the disposition is growing to try to get a little more profit out of their business this year than last. Margins have been cut so closely that it is necessary to do an enormous trade to secure

even a reasonable return for a year's work and risk. In the Heavy Hardware line a similar condition of trade prevails, some houses finding the demand very light, while others are enjoying a good run of business. Collections are very good for the season.

Nails.—The situation is unchanged from the manufacturers' standpoint. They are maintaining prices and making but small sales either of Steel or Wire Nails. The jobbers are stiffening up a little, but have not changed their regular quotations, which are as follows: \$2 @ \$2.05 for small lots and \$1.95 for carloads of Steel Nails, and \$2.40 for small lots and \$2.35 for carloads of Wire Nails.

Barb Wire.—While the demand has been very good, prices have shown no indication of improvement. Small lots of Painted are quoted at 2.75¢ @ 2.80¢ and carloads at 5¢ @ 10¢ per 100 lb less, with Galvanized at 60¢ per 100 lb more. The quotation of 2.65¢ in last week's issue for small lots of Painted was a typographical error. It should have been 2.75¢.

Pig Lead.—Consumers are apathetic, finding the demand for their products very light. A few carloads have been sold at 3.55¢ for Eastern shipment, but the local trade is not inclined to bid even 3.50¢.

Rogers, Brown & Co., who for the past eight years have occupied an office at 98 Dearborn street, Chicago, announce their removal March 15 to the Rookery Building, at Adams and La Salle streets. They will occupy room No. 309, on the first office floor. Quite a movement of Iron firms is in progress to this building. Rogers, Brown & Co. represent 23 furnaces, mainly Ohio and Southern.

The firm of Low & Woodruff has been succeeded by C. E. Woodruff & Co. as manufacturers' agents, at 121 Lake street, Chicago. They are Western agents for Oliver & Roberts Wire Company and the Pittsburgh Wire Nail Company, as well as for manufacturers of Bar and Sheet Iron, Binders' Twine, Refrigerators, Bolts, Nuts, &c.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St. (PHILADELPHIA, Pa., March 12, 1889.)

Pig Iron.—The market remains in about the same condition as noted a week ago. Prices are unchanged, while the demand is still slow, although large enough to absorb the local supply without affecting prices. Offerings from distant points are smaller than they were some time ago, and as reports West and South continue to be favorable makers in this vicinity are inclined to maintain firm quotations, with some degree of confidence that further improvement is only a question of time. The discouraging feature is that consumers do not see their way to a very active demand in the near future, so that orders from them are a little uncertain. Then all hope and the majority seem to expect a good business during the spring and summer months, but for the present it is more a matter of faith than an accomplished fact, so that purchases are made with a great deal of caution. Prices are believed to be at actual rock bottom; this seems to be conceded everywhere, but in spite of that consumers are not taking large lots. They argue that if the demand improves they can "catch on" at a very trifling advance, if not at to-day's figures, and it is not worth while to buy stuff unless they can see their way to use it. Hence with this feeling of indifference it is not to be expected that the market will show much vigor, although, as already mentioned, holders are firm, in sympathy with the West and South,

and also because of the comparatively light supply of good local Irons. The conditions, therefore, are all favorable for improvement if the right kind of a start is made, but whether it will be made or whether things will drift along as they are is for the future to disclose. Present prices are \$18 at tide or No. 1 Foundry, \$17 for No. 2 and \$15.50 for Gray Forge, with 50¢ more, or in some cases 50¢ less, according to circumstances. The majority of sales of good Irons during the week have been at quoted rates, or possibly a shade less to a very desirable customer, but on the whole the market shows an encouraging degree of strength, considering its environments.

Foreign Iron.—No sales of importance have been made, although bids of about \$19, c.i.f., duty paid, could be had for Bessemer. Asking prices as follows: Bessemer, \$19.50 @ \$20, c.i.f., duty paid; Spiegeleisen, \$28.25 @ \$28.50, c.i.f., duty paid, for 20 %.

Blooms.—The usual movement is being made, at about last week's prices, the range being as follows: \$28 @ \$28.50, at mill, for Nail Slabs; \$29 @ \$30 for Sheet-Iron Billets; \$30 @ \$31 for Soft Tank, and \$35 @ \$36 for Flange purposes; Charcoal Blooms, \$52 @ \$54; Run-out Anthracite, \$41 @ \$42.50; Scrap Blooms, \$32 @ \$33 @ "Bloom" ton of 2464 lb.

Muck Bars.—The demand is smaller than for some time past, and prices show irregularity without much strength. The best makes are held at about \$27, delivered, although some are quoted at \$26 @ \$26.50, but buyers seem indifferent, and bids are hard to get except for small lots.

Bar Iron.—There is more doing in small lots, but large orders are scarce, so that mills are getting very little work ahead. The demand is, in fact, the poorest for years, and not only are prices at the lowest, but mills can only be run to about half or two-thirds their capacity, so that work cannot be turned out economically. At present the outlook is very discouraging, as there are no inquiries likely to lead to much improvement. The demand for Car building has fallen off to almost nothing, and the same may be said in regard to Skelp Iron, although at this season a very sudden turn might occur at any moment. Meanwhile prices are irregular and weak, ranging from 1.70¢ to 1.85¢ for Refined Bars, 1.70¢ @ 1.75¢ for Grooved Skelp and 1.85¢ @ 1.90¢ for Sheared, with no demand of special importance so far as known.

Plate and Tank Material.—There has been more demand for the past few days, including an order for Ship Plates to the extent of about 800 tons. There is also some demand for Boiler and Tank Plates, and quite a good demand for Bridge Plates. Prices are very low, however, and to stand any reasonable chance of securing an order offers must be made at figures that can hardly return a new dollar for an old one. Nominal quotations are about as follows (but on large lots lower figures have to be accepted): 1.90¢ @ 2¢ for Ordinary Plates and Tank Plates; 2.1¢ @ 2.2¢ for Universal Plates; Shell, 2.4¢ @ 2.5¢; Flange, 3.3¢ @ 3.4¢; Fire-Box, 3.5¢ @ 3.7¢; Steel Plates, Tank and Ship Plate, 2.1¢ @ 2.25¢; Shell, 2.7¢; Flange, 3¢ @ 3¼¢; Fire-Box, 3¼¢ @ 3½¢.

Structural Material.—There is nothing new on the market, and the feeling is rather gloomy. Specifications on old contracts are coming in a little more freely, so that the mills are fairly busy for the time being, but there does not appear to be much new business in sight at the moment. Prices remain as before, viz.: Bridge Plate, 2¢ @ 2.1¢; Angles, 1.95¢ @ 2.05¢; Tees, 2.4¢ @ \$2.6¢; Beams and Channels, 2.8¢ for Iron or Steel.

Sheet Iron.—The general demand is only fair, although there is a good inquiry for specialties, which is likely to result in several large sales before the end of the week. Prices remain as before for small lots:

Best Refined, Nos. 26, 27 and 28....3 @ 3¼¢
Best Refined, Nos. 18 to 25....2½ @ 3¢
Common, ¼¢ less than the above.
Best Bloom Sheets, Nos. 26 to 28....4 @ 4¼¢
Best Bloom Sheets, Nos. 22 to 25....3½ @ 4¢
Best Bloom Sheets, Nos. 16 to 21....3½ @ 3¼¢
Blue Annealed.....2½ @ 2½¢
Best Bloom, Galvanized, discount.....65 %
Common, discount.....67½ %

Steel Rails.—The market is still dull, and, while it is believed that things are shaping in the right direction for improvement, bids for large lots from the right kind of buyers are not to be had at present. Meanwhile a fair business is being done in small lots of Rails at \$27.50 @ \$28, at mill, and a considerable demand is reported for Blooms, Billets, &c., which, in a measure, renders the mills independent of a good deal of the Rail trade unless from such parties as make their trade desirable. Plenty of Rails could be sold by taking bonds in payment, but in the present state of the money market cash or its equivalent is a *sine qua non*.

Old Rails.—No sales to report as regards spot delivery. Lots delivered along lines of railroad in the interior are taken at \$24 @ \$24.75, but there are very few transactions on the seaboard. Shipments of T's are offered at \$23.75, and lots in store at \$24.50, but buyers manifest no interest in deliveries of this character.

Scrap Iron.—Firm and in good demand. Desirable qualities freely taken at rates quoted below: \$20.50 @ \$21 for cargo lots; \$21 @ \$21.50 for carload lots, delivered, or for choice \$22; No. 2 do., \$14 @ \$15; Turnings, \$13 @ \$14; Old Steel Rails, \$20 @ \$21; Cast Scrap, \$15 @ \$16; do. Borings, \$9 @ \$10; Old Fish Plates, \$23 @ \$24; Old Car-Wheels, \$17 @ \$18, Philadelphia.

Wrought-Iron Pipe.—The demand is fair for the season and a great deal of work is under financial consideration, and while the outcome will undoubtedly be very large, ultimately, there may be some delay before reaching a definite conclusion. In the meantime prices are weak and irregular, with nominal discounts as before, viz: Butt-Welded Black, 55 %; Lap-Welded Black, 65 %; Butt-Welded Galvanized, 45 %; Lap-Welded Galvanized, 55 %; Boiler Tubes, 62½ %.

Nails.—No improvement can be reported in the condition of the Nail trade. Some of the mills have stopped work, but there is a good deal of pressure to realize in some quarters, so that prices are badly demoralized. Lots from store are quoted at \$1.90 @ \$2, but carload lots of some makes are offered at extremely low figures without meeting a very ready demand even then.

St. Louis.

OFFICE OF *The Iron Age*, 212 N. Sixth st.,
St. Louis, March 11, 1889.

Pig Iron.—The improvement noted in last week's report continues, and it now looks as if bottom had been reached and the time for improvement has arrived. Furnaces do not appear anxious to dispose of their product to any great extent, and in some cases on brands that are popular are asking a clean advance of from 25¢ to 50¢ @ ton. Gray Forge is quite active, and some good-sized orders have been placed during the past few days, and figures that were quoted three weeks ago would not be entertained to-day. One lot of 1000 tons was taken a few days ago by a local manufacturer on a basis of \$14, delivered here. Pig mills, machine shops, foundries, stove manufacturers, &c., are all busy, and will soon be in the market to

replenish their stocks, which they allowed to run down in consequence of the depressed condition of trade. A more hopeful feeling is expressed all around, and inquiries are coming in that speak well for the future of the market. Prices are firm, and the figures quoted herewith are generally adhered to, and only in rare cases are concessions of any moment obtained. We quote as follows for cash, f.o.b. St. Louis.

Southern Coke, No. 1 Foundry, \$15.25 @ \$15.75
Southern Coke, No. 2 Foundry, 15.00 @ 15.25
Southern Coke, No. 3 Foundry, 14.25 @ 14.75
Gray Forge..... 13.50 @ 13.75
Ohio Softeners..... 17.50 @ 20.00
Lake Superior Charcoal..... 21.00 @ 21.50

Missouri.

Charcoal Foundry, No. 1..... 16.00 @ 16.50
Charcoal Foundry, No. 2..... 15.00 @ 15.50

Tennessee.

Charcoal Foundry, No. 1..... 17.50 @ 18.50
Charcoal Foundry, No. 2..... 16.75 @ 17.50
Connellsville Coke, f.o.b. East St. Louis, \$4.70; St. Louis, \$4.85.

Bar Iron.—The demand for Bars is very satisfactory and some good-sized orders are being booked, but at prices that are anything but remunerative. Railroad work is improving and its influence is being felt to a certain extent in this department. Notwithstanding the activity prices are so low that there is little or no margin for profit, and it is claimed that in some cases actual cost is not realized. Small lots from store are quoted at \$1.80; Carload lots are quoted at from \$1.65 to \$1.75, according to circumstances.

Barb Wire.—There is no improvement in this branch, as far as prices are concerned, and it is evident that manufacturers will be compelled to wait until the spring demand sets in to enable them to advance prices to a paying basis. The volume of business is satisfactory and indications point to a largely increased demand for spring consumption. Prices are quoted as follows: For carload lots Two and Four Point Painted, \$2.80; carload lots Two and Four Point Galvanized, \$3.40, f.o.b. St. Louis; less than carload lots, 5¢ additional.

Cleveland.

CLEVELAND, March 11, 1889.

Iron Ore.—Activity in Ore circles during the past week seems to have been confined almost exclusively to negotiations with the vesselmen regarding lake freights for the season. The result has been several season charters from Escanaba to Lake Erie ports at \$1.10, which means a season rate of \$1.20 from Marquette and about \$1.30 or \$1.35 from Ashland. Two or three charters from the last-named port, and also from Two Harbors, are reported at \$1.30. The rate from Escanaba seems to have been permanently fixed at \$1.10. This rate not only includes Ore delivered at Cleveland, but also at Buffalo for the Eastern furnaces. Negotiations are known to be pending for substantial quantities of Ore to the furnacemen in the East, who have hitherto used foreign Ore almost exclusively. The Anthracite district affords an entirely new market for dealers in Lake Superior Ore and promises to take care of any possible surplus. Although numerous inquiries have been received from the furnacemen in the Mahoning and Shenango Valleys during the week, it is said that no new Ore beyond that already mentioned in these columns has been sold. The fact that freight rates have been practically established will, however, hasten the opening of the market.

Pig Iron.—Increased firmness and additional advances in prices are reported. The steady demand for Iron has been unaccompanied, however, by any excited views about prices. Sellers seem indifferent about extending sales beyond the

Iron likely to be produced from the Ores already on hand. Prices are about 25¢ per ton above last week's quotations. Mill Irons are selling freely at about \$14.75 @ \$15, and all grades of Bessemer Iron are reported firmer. The following are quotations:

No. 1 to 6 Lake Superior Charcoal.....	\$20.50 @ \$21.50
No. 1 Strong Foundry, Bessemer quality, per ton.....	17.00 @ 17.50
No. 1 Strong Foundry, per ton.....	16.00 @ 17.00
No. 2 Strong Foundry, per ton.....	15.00 @ 16.00
No. 1 American Scotch, per ton.....	17.00 @ 18.00
No. 2 American Scotch, per ton.....	16.00 @ 17.00
No. 1 Soft Silvery, per ton.....	17.00 @ 18.00
Mahoning and Shenango Valley Neutral Mill Irons, per ton.....	14.00 @ 15.00
Mahoning and Shenango Valley Red Short Mills, per ton.....	14.50 @ 15.50

Old Rails.—The market is still dull, with \$21 @ \$21.25 given as a fair price for Old Americans.

Nails.—Steel Wire Nails are now quoted at \$2.35, with no changes reported in other grades.

Ferdinand Schlesinger, president of the Chapin Mining Company, announces that M. A. Hanna & Co. have been appointed sales agents for the Chapin Ore. Existing contracts on Ore on Lake Erie docks will be settled by H. P. Lillibridge, who has been appointed general manager of the Chapin Mining Company.

Cincinnati.

Office of *The Iron Age*, Fourth and Main Sts., CINCINNATI, March 11, 1889.

Pig Iron.—There has been a fair volume of business in Pig Iron during the past week, but no special activity. The changes in prices have not been marked, but the tendency has been toward improvement, and on some grades of Southern Coke Iron there has been an advance of 25¢ per ton realized, which places them on a level with the production of Northern furnaces, which latter brands were held more firmly than Southern output during the break in the market. Charcoal Iron has been relatively easier than Forge grades, and Ohio Softeners and Silveries are reported in larger supply than will sell readily, but there has been no pressure to sell. It is mainly the large and strong buyers who have confidence in the market and are desirous of buying round lots for future delivery, yet even such buyers are not disposed to pay any material advance and no very large contracts have been reported closed, but there have been several 1000-ton lots. Gray Forge has sold at \$13.25; No. 1 Foundry at \$15 and Mottled at \$12.25 cash. The following are the approximate prices current here at the close for cash, f.o.b.:

Foundry.

Southern Coke, No. 1 (new classification).....	\$15.00 @ \$15.50
Southern Coke, No. 2 (new classification).....	14.50 @ 14.75
Southern Coke, No. 3 (new classification).....	14.00 @ 14.25
Ohio Soft Stone Coal, No. 1.....	15.00 @ 16.00
Ohio Soft Stone Coal, No. 2.....	14.50 @ 15.00
Mahoning and Shenango Valley.....	16.50 @ 17.00
Hanging Rock Charcoal, No. 1.....	21.00 @ 22.00
Hanging Rock Charcoal, No. 2.....	19.00 @ 22.00
Tennessee and Alabama Charcoal, No. 1.....	18.00 @ 18.50
Tennessee and Alabama Charcoal, No. 2.....	17.00 @ 18.00

Forge.

Strong Neutral Coke.....	13.00 @ 13.50
Mottled Neutral Coke.....	12.00 @ 12.50
Gray Forge.....	13.00 @ 13.25

Car-Wheel and Malleable Irons.

Southern Car-Wheel.....	20.00 @ 25.00
Hanging Rock, Cold Blast.....	22.00 @ 25.00
Lake Superior Car-Wheel and Malleable.....	21.00 @ 22.00

Manufactured Iron.—There has been a moderate volume of business without new features or essential change in prices.

Nails.—There has been a moderate demand and a steady market without essential change in prices. 12d @ 40d sell at \$1.95 @ \$2 per keg, with 10¢ rebate in

carload lots at the mills. Steel Nails sell at \$1.90 @ \$2, and Steel Wire Nails at \$2.55 @ \$2.60 per keg.

Old Material.—There have been moderate sales and a steady market for Old Rails at \$21 @ \$21.50, and for Old Wheels at \$18 @ \$18.50 per ton, spot cash.

Detroit.

WILLIAM F. JARVIS & Co., successors to Charles Himrod & Co., under date of March 11, 1889, report as follows: While there is undoubtedly a somewhat better feeling, yet the market here is by no means active. Other sections report an advance on some grades, but so far the rise has not reached this market. It is customary for most of the large buyers in this locality to place orders for 6 to 12 months' supply and have the Iron shipped as they may require during that time. Such furnaces as are willing to contract on this basis when prices are at the lowest point have no difficulty in disposing of their output; but those that sell only as they make realize better prices, although they do not sell in such large lots. Most of the Lake Superior charcoal furnaces are maintaining prices, but we have heard of some cutting being done, but to no great extent. With a quiet but firm market we quote as follows:

Lake Superior Charcoal, all numbers.....	\$19.50 @ \$20.00
Lake Superior Coke, all ore.....	18.75 @ 19.25
Lake Superior Coke, cinder mixed.....	17.75 @ 18.25
Standard Ohio Black Band.....	18.75 @ 19.25
Southern No. 1.....	17.00 @ 17.50
Southern Gray Forge.....	15.00 @ 15.50
Southern Silvery.....	16.50 @ 17.00
Jackson County (Ohio) Silvery.....	18.25 @ 18.75
Old Wheels.....	18.50 @ 19.00

Chattanooga.

Office of *The Iron Age*, Carter and 9th Sts., CHATTANOOGA, March 11, 1889.

Pig Iron.—The status of prices is now being looked upon with some degree of anxiety. For the past few days there has been a perceptible lull in the advance that was inaugurated some three or four weeks ago and there is not the continuous advance that was expected by most of the producing element South. Prices have not declined from the highest point reached, but now appear to be at a standstill. It is true that buying is very active and large blocks are being disposed of almost every day. Many large consumers are now buying ahead as much as the disposition of the producers will admit. It is evident that considerable quantities are being bought for speculation, although as yet but little has passed under the control of warehouse receipts. To what extent these transactions will occur will depend much upon the price in the future, for with but few exceptions this manner of handling their output is not looked upon with the highest degree of favor by the principal Southern producers. There are certain brands of Southern Irons that are still maintaining their position in the markets and are realizing \$14 @ \$14.50 for No. 1 at the furnaces, but many brands are being sold for \$12.25 @ \$13 for No. 1, f.o.b.

Louisville.

LOUISVILLE, KY., March 11, 1889.

Pig Iron.—The market has been quiet during the week, with few sales. Parties are in the market for Iron for long delivery, but their views are so low that furnaces are not disposed to sell. There is a good demand for Car-Wheel Irons, especially for deliveries running throughout the year, but offerings are being made lower than Lake Superior Car-Wheel brands have been sold here at any time in the past. Old Wheels are freely offered,

and some have been sold as low as \$17. We quote as follows:

Southern Coke, No. 1 Foundry, new classification.....	\$14.75 @ \$15.25
Southern Coke, No. 2 Foundry, new classification.....	14.25 @ 14.75
Southern Coke, No. 3 Foundry, new classification.....	13.75 @ 14.25
Gray Forge.....	13.25 @ 13.75
White and Mottled, different grades.....	12.75 @ 13.25
Silver Gray, different grades.....	13.00 @ 13.50
Southern Charcoal, No. 1 Foundry.....	16.25 @ 16.75
No. 1 Mill.....	14.75 @ 15.25
Southern Car-Wheel, standard brands.....	21.75 @ 22.75
Southern Car-Wheel, other brands.....	18.00 @ 19.50
Hanging Rock Coke, No. 1 Foundry.....	15.50 @ 16.00
Hanging Rock Charcoal, No. 1 Foundry.....	19.50 @ 21.00
Hanging Rock, Cold Blast.....	20.75 @ 22.75

Pittsburgh.

Office of *The Iron Age*, 77 Fourth Ave., PITTSBURGH, March 12, 1889.

The general Iron and Steel industries continue in an unsettled and unsatisfactory condition. Overproduction, not only in this district but throughout the whole country, is the great source of the present state of affairs, but there is comfort in the fact that there is always a largely increased consumption of everything in this line in the spring and summer seasons, and it is confidently expected that orders will be coming forward pretty freely within the next few weeks. One of our best-informed manufacturers, who has given the matter a good deal of study, says that almost every purchaser of Iron and Steel in this district is losing money. Pig metal, he says, has fallen \$1.75 @ \$2 per ton since last fall, while the finished products have declined from \$3 to \$5 per ton. He says many of the mills would shut down only for the fact that they have their regular customers, who buy from them the year through, and they must keep them supplied, and this, too, at market rates, even if without profit. The same authority says in regard to wages; "The puddler gets \$5.50 in the Pittsburgh district, while the average price paid in all other parts of the United States is \$3.75 per ton and less. The wages paid in all other departments are proportionately greater than at mills in other districts. The Pittsburgh district pays the highest wages in the United States. This is one of the main reasons why we cannot run our mills at a profit under present circumstances. By the Pittsburgh district I mean all plants west of the city."

The coal trade is also in a very badly demoralized condition and additional failures are feared. All the down-river markets are very much overstocked and prices now ruling do not cover lay-down cost from Pittsburgh, and there there appears to be no demand. Some of our oldest river coal operators say that in all their experience they never knew the business to be in as bad a condition as it is at present. The coke interest is also sympathizing with others, but as yet it is not so badly demoralized.

Pig Iron.—There is an increasing demand and the market is steady at the improvement noted in our report of a week ago. Consumers generally are buying freely, and some of them have covered their wants for from 30 to 60 days. Mill Irons have advanced 25¢ per ton, as compared with the lowest; there was no change in prices during the past week, and the market is steady, but unchanged. City furnaces are pretty well sold up, and there is now a chance for furnaces in other localities to sell in this market, but they are at a disadvantage in the matter of transportation, which is a big factor in the present condition of affairs. Consumers claim that there is nothing in the market for the products to justify them in paying more for the raw material; on the contrary, they say that the latter is higher relatively than the former, but they nearly

all feel like stocking up, as they usually do at this season of the year. There is an improved demand for Foundry Irons, and Bessemer Iron is steady at the recent advance. We quote prices as follows:

Gray Forge Neutral.....	\$14.25 @ \$14.50,	cash
All Ore Mill.....	15.50 @ 16.00,	"
White and Mottled.....	13.50 @ 14.00,	"
No. 1 Foundry.....	16.00 @ 16.50,	"
No. 2 Foundry.....	15.25 @ 15.50,	"
No. 1 Charcoal Foundry.....	23.50 @ 24.00,	"
No. 2 Charcoal Foundry.....	21.50 @ 22.00,	"
Cold Blast Charcoal.....	25.00 @ 27.00,	"
Bessemer Iron.....	16.50 @ 16.75,	"

Included in the sales reported were some 7000 tons Bessemer Iron at prices ranging from \$16.50 to \$16.80, cash, and a lot of 1200 tons Neutral Gray Forge at \$14.50, cash, which is the ruling for standard brands.

Muck Bar.—There is some inquiry for futures, but very little for present delivery. We continue to give \$27, cash, as the ruling price, and consumers have no trouble in obtaining all they want for present or near-by delivery at the price quoted. Producers do not care to contract for delivery two or three months hence at the price quoted.

Manganese.—Sales of Ferromanganese at \$58.50 @ \$59, cash, for 80 %, with more doing of late. Spiegel is still quoted at \$28.50 @ \$29 for 20 %.

Manufactured Iron.—There is nothing new to note. Business continues light for the season, and prices are unsatisfactory and irregular, and it is difficult to give reliable quotations in consequence. It is hoped, however, that there will be a largely increased demand as the spring season becomes more advanced. And until there is no improvement in prices can reasonably be looked for. For best quality of Iron prices may be quoted on a basis of 1.70¢ for Bars, 60 days, 2 % off for cash, but poorer qualities can be obtained for considerably less. Skelp Iron is still quoted at 1.60¢ @ 1.65¢ for Grooved, and 1.90¢ @ 1.95¢ for Sheared.

Wrought-Iron Pipe.—There is a fair business, but no improvement in prices, which continue irregular and unremunerative. It is reported that an order for 18 miles of 10-inch pipe was placed here during the past week. Discounts are quoted as follows: On Black Butt-Welded Pipe, 60 %; on Galvanized do., 52½ %; on Black Lap-Welded, 70 %; Galvanized do., 57½ %; Boiler Tubes, 65 and 5 %; 2-inch Tubing, 11¢ per foot, net; 5½-inch Casing, 32¢ @ 33¢ per foot, net.

Old Rails.—There is more inquiry, but no sales have been reported for several weeks, in the absence of which we may quote \$23 @ \$23.50. Holders look for a pretty stiff market as soon as the demand opens up, and it is thought that some of the mills in the Shenango and Mahoning valleys will be on the market before long. Old Steel Rails quoted at \$17.50 @ \$18 for short and \$19 @ \$20 for long lengths.

Steel Rails.—The mills here continue to quote at \$28, cash, for small lots of from 1000 to 2000 tons, but a large order could be placed for considerably less. It is said that some large orders have been booked here at but little over \$26, cash. The Rail department of the Allegheny Bessemer Company will be in full blast in a few days; this is claimed to be one of the most complete mills in the United States, having been supplied with all the latest appliances and improvements. The Edgar Thomson mill has been doing some big work, having turned out one day last week 1150 tons of Rails.

Billets, &c.—Bessemer Steel Blooms and Billets are still quoted at \$27 @ \$27.50, cash, as to size, delivery, &c. Sale of 2000 tons Domestic Bloom Ends, at \$18, cash. Domestic Rail Crops may be quoted at \$18 @ \$18.50.

Merchant Steel.—The market for all kinds of Merchant Steel continues in a very demoralized condition; one of our oldest manufacturers remarked yesterday that he never knew the business to be in a worse condition than it is at present. Prices are being cut to such an extent that there is no margin for profit.

Railway Track Supplies.—Prices remain unchanged. Spikes, 2.10¢, 30 days; Splice Bars, 1.70¢ @ 1.75¢; Track Bolts, 2.75¢ with Square and 2.85¢ with Hexagon Nuts.

Old Material.—Demand continues light, while prices remain unchanged. No. 1 Wrought Scrap, \$20, net ton; Wrought Turnings, \$13 @ \$13.50; Car Axles, \$24.50 @ \$25; Cast Scrap, \$14.50 @ \$15, gross; Cast Borings, \$11 @ \$12; Old Car-Wheels, \$19.

Birmingham.

Office of *The Iron Age*,
28, Wilson House,
BIRMINGHAM, ALA., March 11, 1889.

Pig Iron.—The most notable thing in the Iron business of the Birmingham district is a perceptible stiffening, with very little selling. The Sloss Steel and Iron Company are well sold ahead, and, having got somewhat better prices than have been prevailing for some months, are cutting no figure in the local market. The Tennessee, Coal, Iron and Railroad Company furnaces here have light stocks, but are inclined to hold firmly in the conviction of an early better condition of the market. There has been a gratifying improvement in the business methods of furnace plants. Heretofore too many of the companies in this district have put up expensive plants, chiefly with the idea of enhancing the value of property, lands, &c., to sell early and get quick profits. Now there are signs of the business of Iron-making falling into the hands of real Ironmasters. When this occurs it is believed by the older and wiser heads that the Birmingham Iron district will be fixed on a better-paying, more substantial basis than ever. Movements are on foot for the erection within a few miles of Birmingham of four or five more furnaces, some by new and others by old companies. The Mary Pratt, the smallest, a 40-ton furnace, is out of blast. Interest in Steel-making is greater than ever. Reese & Henderson, of patent process fame, are in the city, and a visit from A. S. Hewitt and his brother-in-law, Edward Cooper, is arousing attention. Mr. Carnegie's recent visit here, and the favorable comments of himself and his distinguished companions, seem to have attracted more attention than ever to the advantages of Birmingham. There is a hopeful expectation also of improvement in the business situation generally to come from the conduct of the new Administration.

New York.

Office of *The Iron Age*, 66 and 68 Duane street,
NEW YORK, March 13, 1889.

American Pig.—The market has been quiet during the past week, reports of irregularities cropping up from time to time. We understand that the anthracite coal companies propose to lower the prices to the blast furnaces, that the railroads are about to afford them some relief, and that a reduction in price of Ore from Northern mines is imminent. Taken together, these reductions may enable Northern furnacemen to lower cost somewhat. We continue to quote for standard brands Northern Iron No. 1, \$17.75 @ \$18; No. 2, \$16.25 @ \$17, and Gray Forge, \$15 @ \$15.50, all at tidewater. Southern Irons have been offered at considerably lower prices for Foundry brands.

Scotch Pig.—The market abroad has continued its advance; still sales here are

restricted and prices remain: Coltness, \$20.50 @ \$21; Shotts, \$20 @ \$20.50; Langloan, \$20 @ \$20.50; Summerlee, \$20.25 @ \$20.50 and Dalmellington, \$19.25 @ \$19.50.

Ferromanganese.—The market is fairly active and firm, with Ferro selling at \$56 @ \$57. Spiegeleisen is dull and nominal.

Structural Iron.—Manufacturers report that considerable bridge work is offering, chiefly in small lots. During the past month or two quite a number of large contracts have been placed, among them the Brooklyn Elevated, the St. Louis Bridge, and the Pittsburgh improvement of the Pennsylvania Railroad. Among the orders now on the market is a bridge at Rochester which will call for about 800 tons. Prices on bridge work, however, continue very unsatisfactory, it being stated that they are lower to-day than they have ever been before. We quote Sheared Plates, 1.9¢ @ 2¢; Universal Mill Plates, 2¢ @ 2.1¢; Angles, 1.9¢ @ 2.1¢; Tees, 2.35¢ @ 2.5¢, and Channels and Beams, 2.8¢ on dock. It is reported that the North Chicago Rolling Mill Company have now joined the Beam Association, so that the only concern not a member of it is the Allentown Rolling Mill Company, who manufacture only smaller sizes.

Plates.—We quote Iron Tank, 2¢ @ 2.2¢; Shell, 2.25¢ @ 2.4¢; Steel Tank and Ship Plate, 2.1¢ @ 2.25¢; Shell, 2.35¢ @ 2.5¢; Flange, 2.6¢ @ 2.75¢, and Fire-box, 3¼¢ @ 4¢.

Bar Iron.—We quote: Carload lots on dock, half extras, Common, 1.65¢ @ 1.7¢; Medium, 1.7¢ @ 1.75¢, and Refined, 1.75¢ @ 2¢.

Steel Rails.—We note sales aggregating about 30,000 tons by two Eastern mills, chiefly for Southern railroads. Twenty-three thousand tons of the above was taken by one mill, which has acquired by purchase a part of the allotment of one of the idle mills, the Board of Control last week having decided not to increase the allotment for the present. It is understood that the Western mills were opposed to such an increase for the present, their sales to date having been considerably less, proportionately, than those of the mills east of the Alleghany Mountains. The Board of Control reports sales to March 1 of 590,850 tons, the allotment being 790,850 tons. The shipments up to March 1 by the Rail mills were 142,787 tons. In the West the market appears to be quiet, the only sale reported being that by a Pittsburgh mill of 10,000 tons. There have been a number of rumors in reference to the consolidation of the North Chicago Rolling Mill Company, the Joliet Steel Company and the Union Steel Company. It is understood that the arrangements have been practically carried out, and that the details are now being arranged, the plan being ready to be submitted to the stockholders of the three companies for their approval. It is reported that the capital is to be \$25,000,000, \$5,000,000 to be paid in in cash for working capital, and to provide for a number of improvements, including erection of Plate mills, &c.

Wire Rods.—There has been some business in Foreign Rods at \$41.50.

Old Rails.—The market is dull, with light supplies and a moderate demand. We quote nominally \$23 @ \$23.50.

Scrap Iron.—There is a fairly good demand, and prices are steady at about the following prices for cargo lots: No. 1 Scrap, \$20 @ \$21, delivered on boat; Turnings, \$13 @ \$14, do; Cast Scrap, \$15.50 @ \$16, do; Cast Borings, \$10; Horseshoes, \$23 @ \$24; Coil and Leaf Steel, \$20, to boat.

Track Fastenings.—We quote Spikes \$2, delivered; Angle Bars, 1.75¢ @ 1.80¢, and Nuts, 2.65¢ @ 2.75¢.

Financial.

Fine weather has a cheering influence, but a serious crisis in Paris, troubles among iron manufacturers, depressions in the coal market, lower prices for wheat, all had an unsettling tendency, and the inauguration ceremonies served to distract attention in business circles. Nevertheless, traffic is heavy contrasted with the entire suspension during the "blizzard week" one year ago, and among New York dry goods jobbers there is a firm tone, attended with a healthy condition both as to supply and demand. Respecting the volume of trade in the country at large, the aggregate clearing house returns of all leading cities for three weeks past indicate a gradual decline compared with the same time last year. Even with this abatement there was an increase of 13.3 % during the week ended March 9, and there was a like increase both in and outside of New York. Boston increased 10.5; Philadelphia, 23.9; Chicago, 23; St. Louis, 10.1; San Francisco, 7.5; Baltimore, 13.1; Pittsburgh, 10; Cincinnati, 23.4; Louisville, 24.8; Kansas City, 20.5; Milwaukee, 16.1; Denver, 47.7; Detroit, 15.7; St. Paul, 22; Minneapolis, 27.1; Omaha, 41.1; Cleveland, 23; Richmond, 34; Duluth, 83.6; St. Joe, 28. Stagnation at several points in the Northwest is ascribed to the light wheat crop and unusually mild winter. Governor Merriam, at St. Paul, says: "I look for a quiet business year. The great decrease in building railroads has cut off a tremendous amount of business all over the country. There has not only been a reduced traffic on railroads, but with it a decreased amount of general business. With decreased earnings comes the discharge of employees, and the large number of laboring men out of employment naturally affects the community at large. In addition to this, in Minnesota we were very unfortunate in losing a large portion of the wheat crop, and the State is much poorer than a year ago at this time. The effect of the loss is necessarily felt in all commercial circles." In various directions satisfaction is expressed that the Interstate Commerce Commission has begun to assert its powers under the recent amendments to the law. A meeting will be held at Chicago to-morrow to consider export rates. Business failures in the United States last week numbered 241, against 195 a year ago.

The Stock Exchange markets were irregular, and in several instances there were important declines, influenced chiefly by foreign advices. On Thursday there was no special feature, dullness prevailing. On Friday the market was chiefly affected by the cutting of rates by roads in the Northwest and by depression in the iron trade, resulting from the collapse of the Reading Iron Company. On Saturday the market was sold down after the receipt of news of a panic on the Paris Bourse, the result of a heavy decline in Comptoir d'Escompte and Métaux shares. The bears proceeded to attack the general list. St. Paul, Reading, Union Pacific and Lackawanna all declined heavily. The theory of the bears was that the panic in Paris would directly affect speculation in copper shares and possibly prevent the success of the English syndicate interested in this metal. It was also suggested that gold might have to be exported. On Monday there was an improved tone at the close, after free selling to realize and a renewal of bear pressures. Solicitude was expressed concerning the anthracite shares, the measures of relief possible seeming to be limited either to a reduction of prices or a lessened output of mineral. On Tuesday the market was

dull but prices were steady. The news from the West was contradictory, one report saying that Mr. Walker would not and another that he would accept the position tendered him. The reduced prices for coal officially announced had no effect.

Government bonds are quoted as follows:

U. S. 4½s, 1891, registered.....	108
U. S. 4½s, 1891, coupon.....	107½
U. S. 4s, 1907, registered.....	128½
U. S. 4s, 1907, coupon.....	129½
U. S. currency 6s.....	120

The nomination of George C. Tichenor, of Illinois, to take the place of Judge I. H. Maynard as Assistant Secretary of the Treasury, is favorably received. Mr. Tichenor has been a special agent of the Treasury Department since 1878, during which time he has made a special study of customs methods with reference to under-valuations and other alleged irregularities. This is the first time for at least 20 years that an expert in customs laws and regulations has been appointed to this position.

The weekly statement of the New York banks showed a decrease of \$3,722,250 in surplus reserve, which now stands \$3,545,860, against \$11,487,300 on March 10, 1888, and \$7,998,350 on March 12, 1887. The increase in loans of \$4,069,100 was not unexpected. The currency movement was against this city, the West drawing freely, and Sub-Treasury operations resulted in a loss. Specie decreased \$3,290,400, showing the effect of the interior movement; and legal tenders decreased \$262,900. Deposits increased \$675,800. The quarterly statement of the condition of New York City national banks again makes a very favorable showing. The aggregate loans and discounts are reported at \$308,520,600, in comparison with \$284,076,200 at the date of the last reports.

The money market was more active, with a good inquiry and comparatively few lenders. Offerings were confined to trust companies and institutions other than banks. Commercial paper is less sought for, as the banks generally have filled up with this line, and the supply is only fair. Rates are 4½ % for 60 to 90 day indorsed bills receivable and 4½ to 5½ for four months' acceptances. The Washington Trust Company of the city of New York have been incorporated, with a capital stock of \$500,000. Ex-Assistant Treasurer Charles J. Canda and Solicitor of the Treasury Alexander McCue are members of the company. The New York Chamber of Commerce recommends the repeal of the Saturday half-holiday law, despite the fact that the chamber favored the measure at the time of its enactment. It is intimated from Washington that Secretary Windom will make no immediate change in the policy of the Treasury. The total amount of bonds purchased to date under the circular of April 17 is \$124,558,550, of which \$51,337,300 were 4 per cents and \$73,221,250 were 4½ per cents. The cost of these bonds was \$145,231,588, of which \$65,925,899 was paid for the 4 per cents and \$79,305,689 was paid for the 4½ per cents.

In view of the recent amendment of the Interstate Commerce act authorizing the commission to direct when joint tariffs shall be made public, the commission has ordered that all advances and reductions in joint rates, fares and charges shown upon joint tariffs established by common carriers subject to the provisions of the act to regulate commerce shall be distinctly scheduled and be conspicuously posted ten days prior to the taking effect of any such advance, and three days prior to any such reduction. Each of the railway carriers comprising the Trunk Line Association is notified to appear before the Interstate Commerce Commission in Washington on Saturday next, for the purpose of fully setting forth and showing

what their export rates are and how these export rates are made by each of the companies, and also for the purpose of giving each of the carriers an opportunity to be heard.

The imports of merchandise at this port during the week were valued at \$11,761,000, of which \$4,000,000 represents dry goods. Since January 1 the aggregate is \$101,617,000, against \$98,870,000 for the same time last year and \$90,802,000 in 1887. Exports were \$7,698,595, making the total since January 1 \$69,067,000, against \$59,520,700 last year.

Exports of specie from this port last week amounted to \$556,000. Total since January 1 \$6,373,000, as compared with \$5,443,000 last year. The imports were \$186,000.

Metal Market.

Copper.—The demoralization and excitement in everything connected with Copper on the Paris exchange, reflected in London in the decline both in the metal itself and in shares, at one time carried the spot price in latter city from £64 a week ago to £47 early in the week, and futures from £64 to £51. It was stated that for a moment £46 was reached for spot. Then, however, the reaction set in and yesterday there was an improvement to £58, spot, in order to close at £56, futures having recovered to £52. Comptoir d'Escompte shares closed at Paris at 385 francs, and those of the Société des Métaux, after rebounding to 150 francs, again closed at 117.50, while Rio Tinto wound up at 341.25. It was furthermore called from Paris that the Rothschilds and Barings were in negotiation with the syndicate to assume its holdings at a reasonable figure. It was subsequently cabled that the arrangements which the Société des Métaux was trying to effect with the Copper mines to prolong to 12 years the present contract, had fallen through. While every disposition was shown by the Bank of France to come to the assistance of the syndicate, and while similar efforts were made by certain London banking concerns to help bridging over its financial difficulties, a somewhat improved feeling was fostered, and there was added a readiness on the part of mining companies to carry their output for the next two months, thus opening the prospect of some substantial relief. Henry R. Merten & Co. make the stock of Copper in England and France and afloat thereto from Chili and Australia as follows: February 28, 1889, 218,140 tons; January 31, 1889, 109,528 tons; December 31, 1888, 101,105 tons; February 29, 1888, 52,593 tons; February 28, 1887, 59,546 tons; January 1, 1888, the visible supply in England, France and the United States was 54,098 tons, and on December 31, 1888, 151,995 tons. London dispatches reported that 8000 tons of Copper Matte were sold from London yesterday to Germany at 10½ @ 11/8 unit, or a little over 10¢ per lb, and that 12¼ per unit is now bid. It was also reported that 1000 tons of Bars were sold at £57. Some little speculative trading has meanwhile been done on our Metal Exchange in good merchantable, whereof 56,000 lb April were sold at from 15¢ down to 14.60¢; 140,000 lb May at 14.35 @ 13.50; 28,000 lb June at 14¢; and 28,000 lb July 13.18¢, while Lake was offered at 16.30¢, spot, 16.10¢ March, and 15.50¢ April. Subsequently 140,000 lb good merchantable were sold at 12.75¢ @ 12.90¢ for May and 25,000 lb Lake at 16¢. During the first few days of the week 1200 tons changed hands in London. To-day, with the advance there lost again, Lake closes at 15¢ @ 16¢, spot, nominally.

Tin.—Tin declined from £94. 17/6 a week ago to £94. 12/6 yesterday, for spot, futures giving way from £95. 15/ to £95.

7/6; sales reaching 350 tons in the London market. We have been steady here, with a moderate business doing, 20 tons March at first selling at 21.30¢, but subsequently easing off somewhat, March and April ranging between 21.15¢ and 21.30¢, and May at 21.25¢ @ 21.40¢. Later on, a better feeling obtaining, spot brought 21.25¢ @ 21.50¢; Tin closes steady this morning at 21½¢ @ 21¼¢, spot. *Tin Plates.*—While the English market has continued exhibiting great firmness, with an upward tendency for forward delivery, the market here has developed no new features of an encouraging nature, the sentiment still being one of flatness and indifference. The following are the closing quotations in large lines $\frac{3}{4}$ box: Liverpool quotes Coke 18/ @ 18½; Siemens-Martin Steel, Charcoal Finish, \$4.75 @ \$5.50; Terns, \$4.12 @ \$4.25; Coke Tins, \$4.22½ @ \$4.30, and Wasters \$4.12½ @ \$4.15.

Lead.—Sales have not exceeded 400 tons at 3.75¢ for Common Domestic, with no buyers toward the close at over 3.75¢, 3.80¢ being asked. St. Louis remains steady at 3.45¢ @ 3.50¢.

Spelter.—Has been rather sparingly offered, yet in the absence of an active local demand there has been continued flatness, with prices indifferently well sustained at 4.80¢ for Common Domestic, and Silesian, nominally, 5½¢.

Antimony.—A light trade has prevailed at 12¢ for Hallett and 13¼¢ for Cookson.

New York Metal Exchange.

The following sales are reported:

THURSDAY, March 7.	
25,000 pounds Lake Copper, March.....	15.75¢
25,000 pounds G. M. Copper, April.....	15.00¢
25,000 pounds G. M. Copper, May.....	14.35¢
25,000 pounds G. M. Copper, June.....	14.00¢
25,000 pounds G. M. Copper, July.....	13.80¢
FRIDAY, March 8.	
25,000 pounds G. M. Copper, April.....	14.00¢
112,000 pounds G. M. Copper, May.....	13.50¢
15 tons Lead, June.....	3.80¢
96 tons Lead, April.....	3.80¢
MONDAY, March 11.	
25,000 pounds G. M. Copper, May.....	12.90¢
112,000 pounds G. M. Copper, May.....	12.75¢
TUESDAY, March 12.	
10 tons Tin, May.....	21.20¢
25,000 pounds Lake Copper, spot.....	16.00¢
WEDNESDAY, March 13.	
25,000 pounds G. M. Copper, March.....	13.75¢

Coal Market.

The Coal trade awaited with anxiety a meeting held on Monday to fix the spring opening prices. It is understood that there was a sharp divergence of opinion, a number of those present holding that a reduction would only weaken the market. The final action was the adoption of a scale 10¢ to 15¢ below those of the spring of 1888, as follows, to take effect immediately: Broken, \$3.75; Egg, \$3.90; Stove, \$4.15; Chestnut, \$4. The opening prices for the spring months for four years compare as follows:

	1886.	1887.	1888.	1889.
Grate.....	\$2.85	\$3.55	\$3.75	\$3.75
Egg.....	2.85	3.80	4.00	3.90
Stove.....	3.25	4.15	4.25	4.15
Chestnut.....	3.00	4.00	4.25	4.00

The reduction compared with winter prices made last December for White Ash is, on Grate, 20¢; Egg, 40¢; Stove, 50¢; Chestnut, 65¢. Compared with spring prices for 1887, the changes are much less striking, amounting only to 10¢ @ 20¢ on the larger sizes. Bituminous Coal prices are fixed at \$2.60 $\frac{3}{4}$ ton, f.o.b. at tidewater, the same as last year. No arrangement has yet been made with the Beech Creek interest, from which fact it is argued in some quarters that the so-called "pool" must become inoperative. No definite contracts are announced, but report says that in several instances a number have been secured by Clearfield and

Cumberland parties. Production at all the mines for the week ended March 9 was 485,752 tons, an increase of about 8000 tons compared with the previous week, but a decrease of nearly 200,000 compared with the same week in 1888. Since January 1 the aggregate is 5,285,000, against 5,961,000 for the same time in 1888.

Regardless of the new prices, Stove Coal afloat is selling by individuals at \$4 @ \$4.10, and Chestnut, \$3 90 @ \$4.10. Lehigh, otherwise hard Coal, prices were made on Wednesday, too late for this publication.

Imports.

Hardware, Machinery, &c.

Boker, Hermann & Co., Hwd., pkgs., 11; Arms, cs., 50
 Clark, G. A. & Bro., Mach'y, cs., 189
 Curley J. & Bro., Cutlery, cs., 2
 Dolge, Alf., Mdee., cs., 5
 Field, Alfred & Co., Mdee., pkgs., 6
 Graef Cutlery Company, Cutlery, cs., 8
 Hiller's Son, R., Hdw., bales, 20
 James, Emil, Sewing Machines, cs., 57
 Kator, Ad. Mdee., cs., 9
 King, Ezekiah, Mdee., cs., 2
 Lundborg, Capt. Steel Wares, bxs., 10
 Peck & Velsor, Hwd., bales, 10
 Schoverling, A., Arms, cs., 22
 Sheldon & Co., G. W., Arms, cs., 9
 Swarzenbach, Haber & Co., Mach'y, cs., 12
 Wiebusch & Hilger, Lim., Razor Hones, cs., 14; Mdee., cs., 27; Anvils, 40; Hwd., pkgs., 9
 Order, Hach'y, cs., 2; do. pkgs., 245; Hwd., pkgs., 25

British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, March 13, 1889.

The Copper market has been very unsettled, responding more or less to various statements and rumors. The most favorable announcement, and one upon which sufficient confidence centered to cause prices to advance to £58 for prompts, was that identifying the Matheson Company, of London, with recent negotiations. At the request of representatives of the syndicate, this firm, it is said, has undertaken the sale of the entire stock now under syndicate control. It is understood that a limit on price has been fixed, but, further than that the figures shall not be below the original cost to the syndicate, no information on this point is given. It is semi-officially announced that, in order to facilitate matters, the existing contracts with the mines have been modified, all companies giving assent to a restriction of production. The extent of the curtailment is not stated, but competent authorities express the belief that the plans are sound as a means of restoring affairs to a more normal basis. The machinery, it is understood, will be under the control of the Mathesons.

Interviews with the Rothschilds, Mertons, Strauss and others of prominence, on Tuesday, elicited the opinion in those quarters that under the new arrangement the syndicate would be able to steady the market at prices that would likely bring consumers in. This led to prompt selling up to £55. 10/ @ £56 at the close of business on Tuesday. The market opened weak and unsettled to-day (Wednesday), however, with free offers of prompts at from £53 down to £48, futures as low as £46, and comparatively few buyers of either. Best Selected English Copper has dropped to £60, sellers, with sales light and no improvement apparent in the demand.

With respect to the announcement that some 8000 tons Matte have been sold at

11/ $\frac{3}{4}$ unit, for Germany, I learn, upon investigation, that it correctly represents facts. About 1000 tons of Bars have been sold during the week at £57, also to go to Germany. The market for shares, while still unsettled, is showing greater firmness.

Block Tin has been somewhat adversely affected by the movements of prices of Copper, these having influenced speculative sentiment in some degree, although leading to no forced selling. Under almost complete neglect the price for Straits declined to £94, but quickly recovered, in sympathy with the better turn in Copper, and touched £94. 15/.

Holders of Pig Iron warrants have been realizing freely on this week's advance and the "bears" have sold largely again the last few days. Makers' brands are strong at a further advance, the Continent and Canada being good customers. There is practically no demand from America. The exports to the States during February were about 7000 tons. The make of Hematites has been lessened considerably owing to strikes that forced the damping of nine furnaces. Others are, however, likely to be relighted.

The demand for Tin Plate has improved, particularly from the States, with prices about the same as those offered last week. The question of the formation of an American syndicate to purchase works is being discussed at Swansea, but nothing definite on the subject can be learned. The exports to the States during February were 28,000 tons, against 22,000 tons the corresponding month last year.

Large sales recently are reported of Old Iron Rails for Italy. The prices are not stated, but understood to be below those generally asked by holders.

The demand for Steel of nearly all descriptions, as well as for Iron, is something enormous, and prices still show a rising tendency in all sections. Requirements for consumption and export alone necessitate heavy purchases, but some impetus to operations is given by suggestions of other syndicates in the trade than the one now under way to control Steel Rails.

The fluctuations in prices during the week include 6d to 2/6 rise on Scotch Pigs, 3d on Cleveland Pigs, 6d on Hematites, 1/3 on Steel Rails and Billets, 2/6 on Steel Slabs, 6d on Steel Blooms and 3d on Bessemer and Siemens Steel Tin Plate.

Scotch Pig.—Business has continued active, and prices are again higher nearly all through.

No. 1 Coltness, f.o.b. Glasgow.....	55/6
No. 1 Summerlee, " ".....	54/6
No. 1 Gartsherrie, " ".....	51/3
No. 1 Langloan, " ".....	53/6
No. 1 Carnbroe, " ".....	46/3
No. 1 Shotts, " at Leith.....	58/6
No. 1 Glengarnock, " Ardrossan.....	50/6
No. 1 Dalmellington, " ".....	45/6
No. 1 Eglinton, " ".....	44/6

Steamer freights, Glasgow to New York, 5/; Liverpool to New York, 10/.

Cleveland Pig.—There is still a brisk trade, and the market continues strong. No. 1 Middlesboro', G.M.B., 39/6; No. 3 ditto, 37/.

Bessemer Pig.—Transactions have been large, and the market is strong at a further advance. West Coast brands, mixed numbers, 47/9 @ 48/, f.o.b. shipping point.

Spiegeleisen.—A fairly active business, but no change in prices. English 20¢ quoted 80/, f. o. b. N. W. England shipping point.

Hardware.

Goods continue moving in fair volume, but trade is perhaps a little disappointing, as orders do not cover the quantity of goods anticipated by some who have been expecting an exceptionally active trade. While there is thus some complaint, there is little reason to doubt that the amount of business compares well with other years, and, with the advance of the season, it is expected that a very satisfactory trade will be done. Prices are without material change and collections fair.

Barb Wire.

The New York market shows more signs of activity, and prices are steadily maintained on a basis of 3.5 cents for carload lots Galvanized Four-Point, with the usual deliveries. Small lots are held at 3.8 cents, and 3-ton lots at 3.6 cents.

Washburn & Moen Mfg. Company, Worcester, Mass., and I. L. Ellwood & Co., De Kalb, Ill., issue a joint circular dated Chicago, February 28, addressed to dealers in and consumers of Barbed Wire, in which they call attention to the litigation in regard to Barbed Wire patents and their action against infringers. They allude especially to their suits against the Braddock Wire Company and the St. Louis Wire Mill Company, and their efforts to bring the same to trial.

The Iowa Barb Wire Company, 93 Reade street, are putting on the market a line of Barb Wire with a new barb, to which they refer as follows:

It is apparent that the tensile strength of Barb Wire is not affected by the size of Wire used for the barbs, and that if a lighter barb will answer equally well the saving in weight is clear gain to the consumer. To this end, we now make a Two-Point Barb Wire which we call the "Texas barb." The barb will be flattened nearly one-half, thereby saving one-third the weight of the barb, or about 10 per cent. of the total weight of the Barbed Wire. Our price for this Wire will be 10 cents per 100 pounds, extra, which represents about one-third of the gain to the consumer in weight as compared with other barbs.

Wire Nails.

There is a fair demand for Wire Nails, and prices are without material change. In some cases, however, slight concessions have been made indicating that the market has not yet the strength which it has been hoped would characterize it. Quotations are on the basis of about \$2.25 to \$2.30 for carload lots at factory.

Cut Nails.

There has again been some irregularity, due chiefly to offerings at a low price of a lot of Nails which, it is claimed, were rejected recently by a railroad company. Otherwise the movement is quite satisfactory in volume, considering the season. We quote: Iron Nails in carload lots on dock \$1.80 @ \$1.85, and small lots \$1.90 @ \$1.95.

The Demand for Cheap Goods.

We print below a significant and suggestive communication, which comes from a gentleman occupying an influential position among Hardware manufacturers, whose very extensive familiarity with the trade in all parts of the country, as well as his knowledge of business methods in Europe, give to his views an especial weight. It will be seen that he refers to the demand, on the part of the jobbers especially, for low-priced goods without much regard to their quality, and regards this as one of the mischievous features of the trade, for which he proposes a somewhat radical

remedy, suggesting not only the wisdom of manufacturers in seeking to establish direct relations with the retailers, but also the organizing of something in the way of a manufacturers' syndicate, with headquarters in the leading Hardware centers:

The great fault of the American buyer, especially in the Western market—referring more particularly to that section of the country between the Alleghanies and the Rockies—is that they will not consider quality. If a manufacturer goes to them with an Auger Bit, a Plane Iron or any other leading line of Hardware which is made by a number of different manufacturers, the invariable response of the buyer to the manufacturer is: "Oh, a Shovel is a Shovel, and a Chisel is a Chisel, and you see our trade don't care; it is a matter of price. You may see some advantages in your quality, and it may be a little better, but you make us pay for the difference and the trade won't stand it. A farmer comes in and calls for a Pitchfork and nine times out of ten he will take the cheapest one." So in vain the manufacturer pleads that his goods contain stock that costs him more than his neighbor, that he finishes them more highly than his competitor, that he is more careful in the inspection and details of his business, and that his goods actually cost more. The buyer turns him off and will not take his goods, and the manufacturer goes away despondent because he cannot compete with his low-price neighbor. The only course for the manufacturer is to consult his own interest and place himself in closer connection with the small trade, selling to them at what would be a low price and yet net the manufacturer a little profit which would otherwise be swallowed up by the jobber. The foreign merchant is different. He is willing to stand by an old-established house and handle the article which he knows to be first class in every respect, and so represent it to his customers, and he is more willing and more apt to pay a fair price.

We believe the policy of the manufacturers in this country should be to place their own houses in the principal buying sections of the West—say, Chicago, St. Louis, Kansas City and St. Paul; and if necessary where the manufacturer has only a limited trade let several of them pool their interests at various points and sell their goods through this syndicate, hiring their own stores, salesmen, clerks and travelers, and charging up the expenses according to the business done by each house. It might be expensive at first, but it would pay in the long run, for the manufacturer would have his goods introduced and a call established for them, and not place himself at the mercy of some large jobber who would buy one large bill of him and the next month turn round and buy of some competitor if he could make 24 per cent. by so doing. Our own belief is that the retailer and the manufacturer are coming more closely together every year, and the manufacturer who caters most closely for the retail dealers' trade is the one who will win in the long run, for he is working for his own interest, finding and meeting the wants of his trade. These the jobbers are prone to cover up and make the manufacturer believe his goods are not suited to the market, when the simple truth is they can make more money by handling some other line, and the manufacturer goes away with the idea that his Plows and Shovels are unsuited to the particular market in which he has been trying to sell them, and it would be too much expense to alter his styles. In many ways we can see from a manufacturer's standpoint how he is often hoodwinked out of the trade which he could otherwise cater to and handle nicely.

Miscellaneous Prices.

The following are the list prices of the Never Break Spiders, which are put on the market as the beginning of a line of Stamped Steel Hollow-Ware by the Bronson Supply Company, Cleveland, Ohio. The list is subject to a discount of 50 per cent.:

No.	Diam. of Bot'm. Inch.	List.
7.....	8	\$0.65
8.....	9	.75
9.....	10	.90
10.....	11	1.10
12.....	12	1.30

The following is the price list of D. W. Bosley & Co., Chicago, Ill., for their Rubber Floor Scrubbers and their Bar and Counter Cleaners, and is subject to a discount of 50 per cent.:

Rubber Floor Scrubber.

- No. 1.—Ash Block, 1½ inch; Rubber ¾ inch thick. Ash Handles, 4½ feet long.
No. 1, Heavy, Pure Rubber, per dozen.—12-inch, \$8; 14-inch, \$9; 16-inch, \$10; 18-inch, \$11.
No. 2.—Ash Block, ¾ inch; Rubber 3-16 inch thick. Ash Handles, 4½ feet long.
No. 2, Light, Pure Rubber, per dozen.—12-inch, \$5; 14-inch, \$6; 16-inch, \$7.

Rubber Bar and Counter Cleaner.

- Imitation Walnut, Oil Finish, Block ¾ inch; Rubber 3-16 inch thick, per dozen.—12-inch, \$3.50; 14-inch, \$3.75; 16-inch, \$4.

The Peerless Rubber Window Cleaner is sold from the following list, which, in gross lots, is subject to a discount of 60 per cent.:

- 8-inch, per doz.. \$4.20 | 14-inch, per doz.. \$6.00
10-inch, per doz.. 4.80 | 16-inch, per doz.. 7.50
12-inch, per doz.. 5.40 | 18-inch, per doz.. 9.00

The manufacturers of Common Carriage Bolts were in convention last week, and the question as to the feasibility of advancing prices, as well as other matters connected with the organization, received careful attention. It was not deemed advisable to make any change in prices, but action was taken which it is thought puts the combination in a still better position than heretofore.

Humason & Beckley Mfg. Company, New Britain, Conn., and 80 Chambers street, New York, issue the following revised discount sheet applying to their catalogue, January 1, 1888:

Page.	Dis. per cent.
4-10. Hammers.....	40
10. Tack Claws.....	50
11. Nail Sets.....	50&10
11. Screw Drivers.....	60&10
11. Screw-Driver Bits.....	40&10
12. Saw Sets.....	20&10
12. Belt Punches.....	40
13. Pliers.....	50
13. Box Chisels.....	60
13. Butter and Cheese Tryers.....	25
14. Bolts.....	70&10
14. Malleable Hooks and Eyes.....	70
15. Rail Screws.....	70&10
16-22. Bright Wire Goods.....	87½
23. Meat Hooks, Wire.....	80&25
24, 25. Meat Hooks, Wrought.....	80&25
26. Staples, and Hooks with Staples.....	80&25
27, 28. Hasps and Hasps and Hooks, with Staples.....	80&25
28, 29. Rings and Rings with Staples.....	80&25
29. Awning Hooks.....	80&25
30. Bow Pins.....	60&10
31. Cattle Leaders.....	70
31. Bull Rings.....	70&10
31. Bull Punches.....	25
32. Box Hooks.....	50&10
33. Cotton Hooks.....	50&10
33. Hay Hooks.....	50&10
33. Box Scrapers.....	40&10
34. Nut Crackers.....	40
35. Champagne Openers.....	40
35. Can Openers.....	50
35. Key Rings.....	40
35. Hoof Cleaners.....	20
36-51. Cork Screws.....	40
52-95. Pocket Cutlery.....	33½
96. Tuning Forks.....	20
96. Triangles.....	60

F. A. Reiher & Co., Chicago, Ill., issue a circular showing, in convenient form, their different patterns of Transom Lifters, of the manufacture of which they make a specialty. They call special attention to their new No. 801 Self-Locking Transom

Lifter, the improvement in which consists in the combination of the handle fastened to the operating rod, connected with the flat stationary locking and guiding bar, placed at the lower end, which is referred to as locking the long operating bar securely in any desired position and preventing it from being bent, displaced or broken. A full description of their Lifters is also given in their catalogue. Their discounts applying to their list January 1, 1887, are as follows:

Bronzed Iron Rods.....50, 10&2%
Brass or Real Bronze.....30%

The manufacturers of Tackle Blocks, who have for some time been considering the feasibility of a more satisfactory understanding in regard to production and prices, have consummated an arrangement which is expected to give this line a greater regularity than has recently characterized it

G. & M. Nolin, Skowhegan, Maine, manufacturers of Scythes, Grass Hooks and Sheep Shears, quote their Grass Hooks and Hay Knives to the retail trade at the following prices:

Grass Hooks, per doz.....\$2.25
Hay Knives, per doz.....10.00

Items.

The Terry Mfg. Company, Horseheads, N. Y., have issued a new catalogue, in which they describe their Hardware specialties and call attention to their foundry and machine shop. Descriptions are given of their Standard Bracket, Double-Braced and Thimble Bracket Rack, the Terry, Ideal, Leader and Favorite Hangers, Stay Rolls, Door Pulls, Wire Cutters, Harness Hooks, Chest Handles, &c.

Westcott Chuck Company, Oneida, N. Y., in their illustrated catalogue of Westcott's Patent Chucks, describe two styles of Drill Chucks, the Little Giant Improved and the Oneida, and five styles of Lathe Chucks, Scroll Combination, Geared, Plain, Universal, Independent and Cut-Off. The special features of these Chucks are explained, with illustrations showing clearly their construction.

The Toledo Block Works, Toledo, Ohio, issue a neat and convenient catalogue representing their Wood and Wrought-Iron Tackle Blocks, Lignum-Vitæ and Iron Sheaves, &c., and alluding also to their Sidewalk Lights, Gratings, Iron Fencing, Stairs, &c.

Bonney Rapid Vise Company, Clinton, Iowa, issue a four-page price list, describing their Rapid Transit, New Giant, Patent Never Slip Pipe and Bench, and other new patent Rapid Vises. They expect before long to issue a 20-page catalogue of these Vises with some recent improvements.

D. C. & H. C. Reed & Co., Kalamazoo, Mich., issue a catalogue in which they describe a line of Floating Spring Tooth Harrows, One and Two Horse Spring Tooth Corn Cultivators and Broadcast Seeders. It describes a variety of implements and machines, in which some improvements have been made within the past year.

Sargent & Greenleaf, Rochester, N. Y., for whom Sargent, Greenleaf & Brooks are agents, 43 Franklin street, Chicago, Ill., issue a very elegantly printed revised price list of their Key Locks, Bolts, &c., in which they represent their line of Mortise Locks, Night Latches, Cabinet, Trunk and Chest Locks, Tin Box Locks, Padlocks, Sub-Treasury, Safe Door Safety Deposit Locks and other fine goods. Their Combined Lock and Latch for outside doors of dwellings is prominently illustrated, and the excellence of its construction and its security emphasized. It is evident that the company have added many new Locks to their line, while at the same time older styles have been improved. Sargent,

Greenleaf & Brooks, 48 Franklin street, Chicago, have also issued a new price list of this line, without illustrations. They are offered as especially adapted to the wants of the best Western Hardware trade. Attention is particularly called to their Adjustable Spindle for Knobs.

E. T. Barnum, Detroit, Mich., has issued his spring supplement which relates to Roof Crestings, Counter Railing, Iron and Wire Settees, Chairs, &c. Wire and Iron Window Guards, Stable Fixtures, Fire Escapes, and an extensive variety of Builders' Wire and Ironwork.

A gentleman connected with the trade in Agricultural Implements who has recently returned from a trip to China refers as follows to the tools used in that country and the lack of enterprise manifest in their antiquated forms:

The one thing that struck me most forcibly of all the queer things to be seen there was the wretched Agricultural Implements the people use. I am in that line of business myself, you know, and that is the reason, I suppose, why the want of good tools impressed me so much. If the Chinese are as shrewd and inventive as they claim to be, why have they used for thousands of years a plow that is simply a broad blade fastened to one rough handle and never cuts the ground deeper than 6 inches, generally 2 or 3? They thresh yet with a stone roller and winnow by tossing the grain into the air. For a harrow they use the hoe, and everything else about the farm is on a similar scale. The nation is largely composed of farmers and there ought to be a splendid market there for American Implements. One great obstacle in the way, of course, is the conservative spirit of the people, and another their extreme poverty; but if they could once be waked up to the possibilities that lie in the use of decent farming tools, the magnitude of the demand that would ensue would well repay the pioneer manufacturer who risked some money in the endeavor.

Thomas H. Chubb, Post Mills, Vt., has issued a handsome and comprehensive retail catalogue for the present year, showing a large line of Fishing Rods and Anglers' Supplies, most of which are referred to as of his own manufacture, the others being made to order and carefully selected, so that anglers can depend upon the goods as being as represented. The catalogue opens with a description of Chubb's Hexagonal or Six Strip Bamboo Rods, the different patterns of which are illustrated. Illustrations are also given showing some of the different departments of his factory. Reels in large variety, Flies, Hooks, Spoons, Fly Books and miscellaneous Anglers' Supplies are also prominently represented.

F. Roloson, Baltimore, Md., issues his catalogue with appendix, in which new patterns of Refrigerators and Buffets are illustrated and described.

A. J. Jordan, 612 Washington avenue, St. Louis, Mo., issues a circular calling attention to his line of AAA1 Cutlery, in which he alludes to his extensive establishment running through from Washington avenue to St. Charles street, and his factory in Sheffield, England. The extent and excellence of his assortment are alluded to, and a number of illustrations given representing some specialties and leading goods in his line.

Bullard & Gormley, dealers in Builders' Hardware, Cutlery, Tools, &c., 106 Lake street, Chicago, have secured the adjoining store, No. 108, and intend to fit it up as an exhibit and salesroom of Builders' Hardware Specialties. They intend to exhibit full-size working models of such articles as they shall select, and will have experienced retail Hardware salesmen to explain them and set forth their merits. They will also canvass architects, owners

and builders in the interests of the same. They will make no charge for standard goods, the profit on the sales being expected to pay for the trouble taken and expense incurred. Special arrangements will be made with manufacturers of new articles which are to be introduced. They solicit correspondence with manufacturers on this subject.

The *West Coast Trade*, alluding to the leading business houses of Tacoma, Wash., refers at some length to the Tacoma Hardware Company, John Macready & Co. and Hunt & Mottet. The Tacoma Hardware Company were organized two years ago and are referred to as having met with excellent success and carrying one of the largest and most complete stocks of Hardware on the coast. John Macready & Co. are said to be the oldest Hardware establishment in the city, having been founded by John Macready, of Sioux City, Iowa, who entered the firm in 1888 and has given special attention to the building up of the business since that time. Hunt & Mottet claim the honor of being the pioneer jobbers of Hardware, having embarked in the business in 1884. They have recently increased their capacity for handling goods by the addition of a 35 x 120 feet basement in the Coggswell Building.

Announcement is made by the Wire Goods Company, Worcester, Mass., that they have purchased the entire stock and plant of F. O. North & Co., Boston, Mass., and will add their line of Automatic Blind Fixtures to their regular list of manufactures. They send out a circular relating to these goods and illustrating their construction and use. They also issue a new page for their catalogue, in which they give revised list prices on their Universal Double-Joint Chain and illustrate its use as a sash chain. A page also refers to Chain Links.

Rector & Wilhelmy Company, Omaha, Neb., issue an attractive 52-page price current, relating principally to seasonable goods. It contains quotations, which are given in cipher, the key being prefixed. It is prefaced by the following circular to the trade:

We trust you will preserve this circular, because you will find in it many goods that your customers will call for from time to time, and you can make sales by it and make money on the sales. Because it will serve to remind you that we want your business, and that you can save time and money by placing it with us, because we make prompt shipments, low prices, and don't substitute; give special attention to mail orders and guarantee careful selection of goods and bottom prices, and because you can order goods from us, get them in and sold, the money in your pocket and more goods on the way before your goods are in from the East. "A nimble nickel makes a fat dollar." Your inquiries and orders solicited. Prices always right. We invite attention to the fact that we are direct importers of Tin Plate, receiving same direct from the makers in Wales through the Omaha Custom House. This assures our trade a first-class grade of Plate in perfect condition and free from the manipulations of tricky importers and brokers. Our Tinto Terne is the finest in finish and working qualities ever sold for the money, and the genuine Calland Brand has no superior. Write us for special prices on large lots.

William H. H. Bixler & Co., Baltimore, Md., have improved their Patent Oyster Winder during the past season, giving it a much wider spool. This permits the use of a larger rope and adapts the Winder more particularly to oyster beds in deep water. This Winder is referred to as popular and in general use on the oyster grounds of Maryland and Virginia, and as having been used to a limited extent on Long Island Sound and neighboring oyster grounds. They have lately been ap-

pointed Southern agents for Richardson's Steerers and the Eureka Ice Crusher, and are also agents for the Somerset, which is referred to as something new in steering machinery.

St. Joseph Pump Company, St. Joseph, Mo., issue a new edition of their circular relating to the Perfection Water Elevator and Purifying Pump. They illustrate the construction of the cup or bucket and its use in the pump, pointing out the advantages possessed by it. They also give price list.

It will be seen by the advertisement on page 47 that the long-established business of the late George S. Arnold is offered for sale. For those desiring to engage in this line of trade—plumbing, gas-fitting, stoves, mantels, &c.—the opportunity is deserving of their attention. Full particulars may be obtained from the administratrix, Eva G. Arnold, corner State and Crown streets, New Haven, Conn.

The Northwestern Rubber Company have succeeded to the business of both the Hamilton Rubber Company and R. T. Whelpley, of Chicago. They will maintain at 141 Lake street, Chicago, the sole Western agencies of the factories of the Hamilton Rubber Company, the Star Rubber Company and the New York Woven Hose Company. The new company is a corporation with a paid-up capital of \$100,000. R. T. Whelpley is treasurer and Edgar Whitehead secretary. They desire to impress upon the trade that they are not jobbers in the sense of middlemen, but are the direct agents and distributors of the product of the companies above named and carry in stock a full line of their goods, to be furnished at manufacturers' prices. They notify the customers of the Star Rubber Company that on the 18th of February the injunction issued against them by the Boston Woven Hose Company was dissolved in the United States Circuit Court at Trenton, N. J.

Hartley & Graham, 17 and 19 Maiden lane, New York, have issued a price list, March, 1889, of Guns, Revolvers, Ammunition and Sporting Goods. Besides illustrating, with list prices, the leading goods in these lines, it calls attention to the fact that they are agents for the Union Metallic Cartridge Company, Bridgeport Gun Implement Company, Remington Arms Company and other manufacturers.

Cleveland Spring Company, Cleveland, Ohio, issue a small price list of their Carriage, Wagon and Seat Springs, of which the different patterns are illustrated. They emphasize the claim that they make Springs with solid steel heads without seam or weld. They also issue circulars relating to their new Triple Duplex Carriage Gear, and the American Chief and Lone Star Duplex gears.

Jones Hollow-ware Company, Baltimore, Md., manufacturers of Enameled, Turned, Round and Plain Hollow-ware, have appointed King, O'Connor & Co., Baltimore, Md., their exclusive selling agents for the South. They will carry a stock of the goods at their warehouse, 11 West German street, and will be in a position to guarantee prompt shipments at lowest market rates. A similar announcement is made by the Mount Carmel Bolt Company, manufacturers of Wood Screws, Tire and Stove Bolts, Rivets and Washers, Mount Carmel, Conn., who have also appointed King, O'Connor & Co. their exclusive selling agents for the South.

The new catalogue of the Cleveland Twist Drill Company, Cleveland, Ohio, represents very satisfactorily their line of Increase Twist Drills, Self-feeding Reamers, Taps, Cutters, &c., of which a large assortment is thus offered to the trade.

They have very much improved and enlarged some of the lists, among which may be mentioned Nos. 111, 116, 118 and 120, and they have added No. 113 Dowel Point Drills and No. 115 Bit Stock Counter-sinks. They refer to the fact that their Drill has a flute of equal area from the point to the shank, and that each Drill is carefully inspected after every operation. They refer also to the fact that they are the sole manufacturers of Miller's Patent Self-feeding Reamers. Micrometer calipers are used throughout their entire factory, and parties ordering special tools are requested to give sizes wanted in thousandths of an inch. The catalogue also represents the Drill Cases made by the company, of which three sizes are offered to the trade. Since moving into their new factory they advise us that they have had all the business they could handle, and the prospects for the year are regarded as exceptionally good.

That Boy and His Future.

BY KNARF.

There is so much and so many things that go to make up a man's character, so many causes for defeat or success in life, so much in the make-up of the man, as a whole, that to analyze these perfections and defects is a Herculean task. The inherited dispositions and pre-dispositions are the easiest to cultivate or the hardest to overcome. Things bred in the bone crop out through life, however much external enamel has been put on by society, education or cultivation. No character is perfect at the first, and it is a part of the necessary work of life, a labor at which we must continue, to change these defects to the standard of our perfections to insure a perfectly rounded life. This is a work to be begun early in life—so early, in fact, that few boys or young men are capable of going it alone, but need sage advice and persistent looking after at the start, and a start in the right direction is almost always indicative of the ending. The natural trend of a boy's mind, if not wrong, should be encouraged, and all the natural aptitudes taken advantage of, in selecting what will be for him his prospective life-work. The writer's opinion, strengthened by years of experience, and an assurance that he was started wrong in his life-work, is this: That every boy should have a trade or profession. Almost every boy shows a predisposition for books or tinkering. Of course there is a certain percentage of men that never amount to anything, others who do not appreciate advantages given them, but this does not lessen the responsibility of the natural guardian of the boy to try and start him right. A father said to me: "My son of 14 has no idea or desire to accumulate money, and no appreciation of money value; he wants to read all the time. I wanted to make a business man out of him, but there is no business in him." Upon inquiry, I found travels and history were the boy's delights, and my advice was to put the best of such books in his way, and if his likings did not change to give him a college education and let him choose a profession. He is not a delicate boy, but large for his age, robust, and enjoys exercise, and has a constitution that, with care, will permit of a large amount of hard work. Another father, a mechanic, of German extraction, in conversation said: "It is hard for me to get along, particularly now. I have two boys and a girl to whom I am giving a good public school education, also music, and when the boys are old enough they shall learn a trade; and if they can't get along then, they couldn't if they were millionaires. The music will give them a cordial reception in the best society wherever they go." To me this was the most sensible plan of education I had ever heard.

We take it for granted that the moral

and religious training is an accepted necessity, so I will not enlarge upon that at this time. It is a deplorable fact that our most skilled workmen in mechanical departments are foreigners, and they are skilled because they thoroughly understand their trade. While the range and extent of a mechanic's trade has been curtailed by developments in machinery, yet, what he has to know should be as thoroughly known as when the carpenter went to the woods to cut the timber for the house. A great mistake is made in not lending the apprentice your experience, and encouraging him with the thought that dirt and drudgery will not be his life always, but that the highest degree of perfection leads to higher planes. After a start has been made and the young man finds he is not suited to the business he has chosen, it is no always a sign of a fickle nature to want to make a change. The sooner a person gives up a line he don't like the better for him. No man can make a success of anything that he can't enter into heart and soul. A lawyer of note was sitting cross-legged on a tailor's bench at 22: a doctor had medical books stuck under the counter in the country store at 18, and so we might name many more instances of the same kind. As a tailor or clerk these men would never have been a success. Circumstances are often such that a man can't make a choice, but is pushed on by the inevitable to work at something ungenial, and something he is unfitted for by education, disposition and temperament. To that person I would say, change as soon as you can. Life is too short to waste time and energy on something out of which you cannot get satisfactory results. If you can make a living out of what you are not fitted for, you can make a big success of what you like. It often takes moral courage and grit to make such a change, but when your mind is once made up, and the opportunity offers, don't hesitate.

There are fewer failures in trades than in mercantile life. In the latter only one-tenth that start succeed. The weekly reports of failures throughout the United States show that 200 or 300, for one reason or another, have failed to connect and have shut their doors. On the other hand, I have never known a good mechanic to be long without a place to work, however many poor workmen may be unemployed. Those who strike are not included in the above statement. The history of the results of strikes has been that the striking workman has failed to secure any higher rate of wages than the man who has independently and unaided by societies put his labor and skill into the market for what it would bring.

Young men are anxious to go into business for themselves, to be their own boss. This is very enticing, but, as a rule, they have little or no idea of the expenses, responsibilities and small results that are contingent upon such a move. Passing along the business portion of the town they see stores with attractive stocks of goods, warm and comfortable inside, and it seems so easy to run a store. But they little know the worry and trouble piled up behind the smiling face of the proprietor, of the bills payable and unpaid accounts receivable, of the loss in the last year's business as shown on the inventory just taken and of the unexpressed yearnings to be as free from care as the envious young man on the outside.

The buyer and head of a wholesale house said in my presence that he would gladly exchange his work with any porter in the house and pull up goods all day on a hand elevator. The methods of doing business are changing so rapidly, the competition is so strong, the mass of people are becoming each year more conversant with the value of goods by reading circulars and price lists sent broadcast over the land, that the business man must

continually hustle to even make a living. Losses on book accounts, losses on old and depreciated stock, rapid change of styles—all these and many other things cut a deep notch in the merchant's profits. The time is passed when the merchant can say to a customer: "If my price don't suit you leave the goods." The veracity of the average customer may well be questioned, as there is no hesitancy on their part to mention a price at which your competitor offered them the same article. Rather than acknowledge that they are wrong they will pay your asking price somewhere else.

Real estate investment will pay better than a business enterprise, as a rule. It is safe to say that any piece of property has doubled in value in the past 25 years. It is also safe to say that very few business houses in the country 25 years ago are in existence to-day. If the young man has a few hundred dollars, instead of going in business, and consequently giving up his situation, let him buy a lot. Buy it in the part of the town or city that is growing most—the direction in which the town is moving. Buy the best lot you can, even if you have to borrow some money to pay for it. By saving you can soon wipe out the debt, and it will be an incentive for you to save. Usually it is not a good idea to have interest to pay, unless you have interest coming in to offset it, but you will be excused in this case, as the advance in your property will more than offset the interest. As soon as your lot is paid for you will have no trouble in borrowing money enough to build a house and rent it. Then your rent will pay your interest and some be left to apply on your principle. By this time people will begin to notice you and say, "He is a saving boy," "a thrifty fellow." You will think more of yourself and others will think more of you. Very soon people in tight places will offer you bargains in property and before you are ten years older you will be on the way to wealth.

The advice to the young man is equally good for the parent or guardian. Start the boy by helping to pay for a piece of property; it will encourage him and also teach him the value of money in the paying of his part of it. The habit of economy and saving will be of incalculable value to him in the future. It will give him standing and prestige. There is hardly a town you can go into that you will not have pointed out to you lots or pieces of land which your informant will tell you could have been bought for so-and-so five or ten years ago, and that he had the money to buy with and now sees how foolish he was not to buy. You say to him: "Why not buy some lots now?" "Oh no; they ask too much money for them." And that was the reason he did not buy five or ten years ago—they were too high then, and in ten years more he will see the mistake he is now making. Of course, in some of the older Eastern villages property is decreasing in value; in the same localities merchants' sales are growing less each year; people, especially the young men, are seeking homes where there is more life—these are the places to invest.

We do not suppose that all readers of *The Iron Age* will invest in real estate after reading this article, and for this reason the chances for young men who have a little money—or should have—and want to invest are all the better. Ask any business man of experience if in the past 10 or 20 years he would not have made more money by investing in real estate and working on a salary than he has made in his business and then abide by his decision.

Witherbees, Sherman & Co., of Port Henry, are about to make exhaustive experiments on magnetic separation. At an

early day the Ball-Norton machine is to be tried, followed by the Wenstrom, Edison and others.

The Coke Trade.

Advices from the Connellsville region are to the effect that a slight improvement in the demand for coke has taken place, and production and shipments have increased to some extent. There has also been a stiffening in prices and there is not so much cutting being done in order to effect sales. While the price of coke has been published for some weeks as \$1.25 per ton, it is known that there has been a large amount sold under this figure. It is believed that if the demand continues to improve, the published price will be more easily obtained than is the case at present. For the week ending on March 2 there were 12,151 ovens in blast, 1110 idle and 720 in process of construction. During the two previous weeks there were 12,383 ovens in blast and 878 idle. The shipments for the week ending on March 2 were as follows: To Pittsburgh and river points, 1200 cars; to points west of Pittsburgh, 3520 cars; to points east of Connellsville, 1160; total, 5880 cars. The figures for the previous week were as follows: Pittsburgh, 1200 cars; West, 2820; East, 1100; total, 5120. The increased shipments west of Pittsburgh are due to the fact that a number of large furnaces which have been overstocked with coke have commenced to receive shipments again. Prices may be quoted nominally as follows: Furnace coke, \$1.25; to dealers, \$1.35; foundry coke, \$1.50; crushed coke, \$2.20; all on board cars at ovens, per ton of 2000 pounds. Freight rates from ovens to Pittsburgh, 70 cents per ton; to Shenango Valley, \$1.35; Cleveland, \$2.80; Chicago, \$2.75; East St. Louis, \$3.20. Foundry prices at Western points are quoted as follows: Chicago, \$4.25; St. Louis, \$4.70; Louisville, \$4.70; Kansas City, \$6.75; Toledo, \$4.00; Buffalo, \$4.00. In the latter place, Reynoldsville coke is quoted at \$3.25 and at Chicago at \$4.25. New River coke brings \$4.25 at Chicago and \$4.75 at Louisville.

A company composed of Maine and Illinois capitalists has purchased over 2100 acres of iron-ore land in the vicinity of Bluffton, Ala., and have so far advanced that they are now asking bids on a coke furnace having a capacity of 100 tons per day. The concern alluded to is called the Bluffton Land, Ore and Furnace Company, which is now shipping 200 tons of brown ore daily to Tennessee furnaces, preparations being under way to increase the output to about 500 tons per day. Bluffton is on the Selma Division of the East Tennessee Valley and Georgia Railway, and two miles from the East and West Railway of Alabama. S. H. Keller, of Williamsport, Pa., is building for the Bluffton Company a large hotel.

Steel pipe has been adopted by the city gas companies of Chicago in preference to wrought-iron pipe for making connections between the mains and houses. The two kinds of pipe had been previously subjected to very thorough comparative tests, which the steel pipe is reported to have endured the most satisfactorily. The quantity which will be used this year will be about 1,000,000 feet. The manufacturers of steel pipe regard their victory in this contest as of much importance.

When Secretary Whitney relinquished his office he left as a legacy to his successor the responsibility for building eight new vessels, authority for whose construction was given by the Fiftieth Congress during its session. The list includes three

2000-ton cruisers or gunboats, vessels somewhat larger than the Yorktown, just finished, and similar to that vessel in many respects, although embodying many new features. There will be two 3000-ton cruisers. These vessels will be smaller by 1000 tons than the new cruiser Newark, but by law they are required to attain the extraordinary speed of 20 knots an hour. A great ironclad of 7500 tons, a protected cruiser of 5300 tons and a small gunboat of 800 tons burden complete the list. Designs for these vessels have already been prepared by a naval board and await approval by the Secretary. Meanwhile, in anticipation of that approval, Commodore Wilson, of the Construction Bureau, has added to the force of draftsmen employed in preparing the details of the designs, and it is believed that advertisements for proposals for building some of the vessels could be issued within two months.

It is stated that Perry & Co., stove manufacturers, of Albany, N. Y., and at 86 Beekman street, this city, have obtained an extension from their creditors of 6, 12, 18, 24 and 30 months, on liabilities of about \$330,000, a large part of which was for borrowed money. The committee of creditors appointed to take charge of the matter consists of Robert C. Pruyn and Edgar Cottrell, of Albany, and a member of the firm of Nash, Spaulding & Co., of Boston. It is understood the firm's indebtedness is to be liquidated by the collection of the bills and accounts receivable due the firm, which will require considerable time. It is said that John S. Perry has also transferred all his individual property, estimated at \$80,000, to the committee of creditors as security for the payment of the firm's debts. The Perry Stove Company who have succeeded to the business of the firm, were incorporated January 1, 1889, with an authorized capital stock of \$500,000, and take the plant and foundry of the old firm, valued at \$345,000. Arthur A. Thompson, the manager, at 86 Beekman street, said that Perry & Co. had just obtained the extension of 6, 12, 18, 24 and 30 months, which would be paid out of the bills and accounts receivable as collected, and that the liabilities were about \$330,000. He wished it to be distinctly understood that the extension was solely of the debts of the firm of Perry & Co., and had nothing whatever to do with the Perry Stove Company. The latter took the plant and foundry as the contribution of the Messrs. Perry to the capital stock of the company, and the company have a cash capital of \$200,000.

The freight rates on pig iron from the Shenango Valley, Pa., and the Mahoning Valley, Ohio, have been advanced to \$3.30 per ton to New York and \$4.30 to Boston. The new rates will go into effect on Monday, the 18th inst.

The Navy Department has postponed from March 15 to April 3 the time for receiving proposals for the construction of an armored coast-defense vessel. This order of postponement was Secretary Tracy's first official act.

Some of the Board of Directors of the Panama Canal Company propose that the Tehauntepec Ship Railway Company shall substitute their system for the proposed canal on the unfinished part of the work, about 42 miles. The estimated cost for building the canal for this distance is \$160,000,000. The ship railway would cost \$40,000,000.

The Emigration Commissioners at this port in their report to Washington ask that the power transferred from them to the Treasury Department not long ago may be restored.

New Anthony Wayne Washers.

The Anthony Wayne Mfg. Company, of Fort Wayne, Ind., have just completed what will be designated to the trade as

rectangular, as is done in other machines of this kind. This obviates the catching of clothes on the corners, which would occur in the use of a square shaft, causing a dragging motion in addition to making



Fig. 1.—The Improved Anthony Wayne Washer.

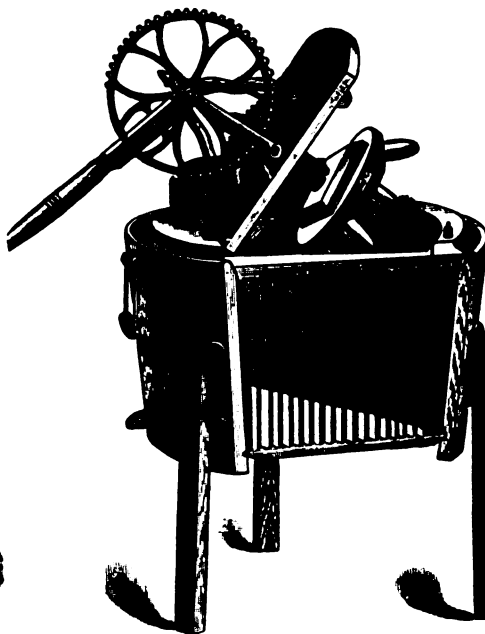


Fig. 3.—Interior View of Nos. 2 and 3.

their New Nos. 2 and 3 Washing Machines. The accompanying description and illustrations have more especial reference to the No. 2 machine, the No. 3

the machine run hard or heavy. The upper portion of this shaft and the small bevel gear-wheel (14), Fig. 2, are cast in one piece, thereby avoiding all possibility of

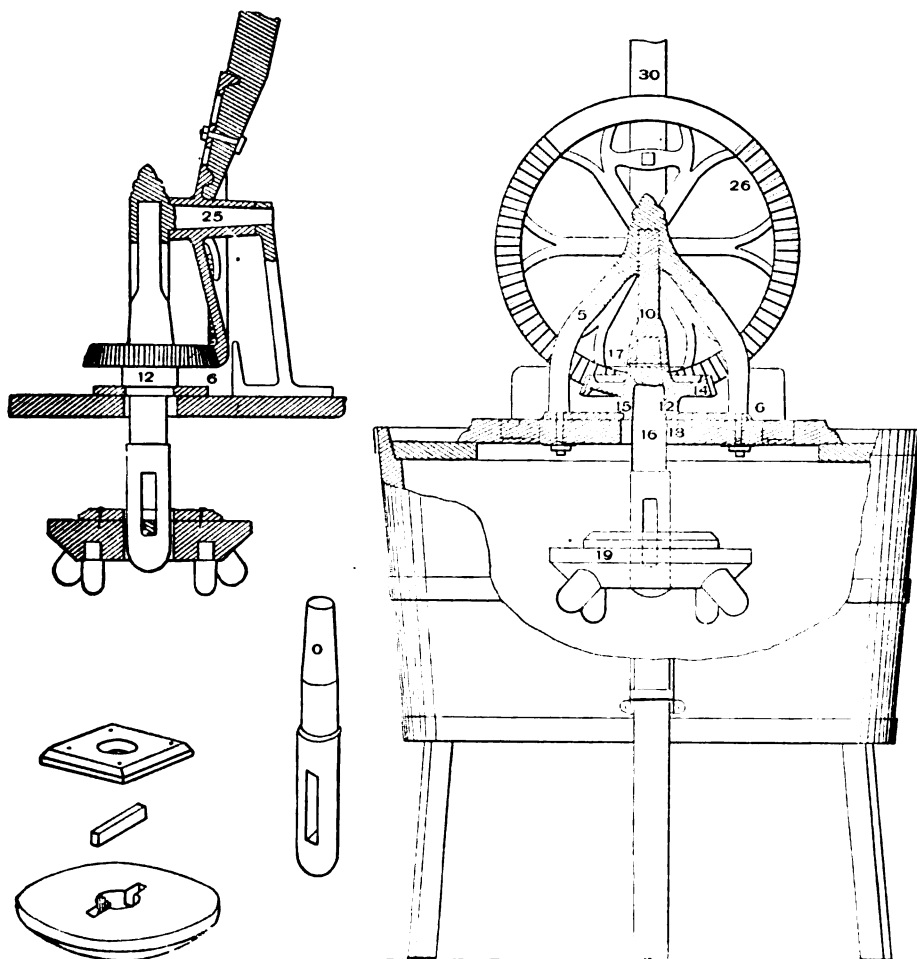


Fig. 2.—Construction of Anthony Wayne Washer.

being but a modification in a few minor details of the No. 2. In reference to the engravings, Fig. 2 illustrates the wooden

post or shaft has a good bearing for its journals above and below, and the socket

(12), Fig. 2, is held in its place by the arch, into the feet of which it is recessed, so that the whole gearing is made as one piece and cannot get out of order. The wooden post in the new machine is entirely below the lid, and is fastened to the iron by being driven into a socket and held in its place by an iron pin through the post. Journaled in a bearing in the central and highest portion of the arch (5) is a vertical metal shaft (10), having a socket (12) at its lower end, which rests upon the plate (6) and is provided with a deepening collar (13), which lies in an opening in said plate, the whole forming an immovable bearing or journal for the shaft (10). Cast upon the lower end of the socket piece and forming one piece with the vertical shaft (10) is a miter gear (14), having a horizontal shoulder (15) resting upon a plate (6); inserted in the socket of the metal shaft is a cylindrical shaft (16) of wood attached to the metal socket shaft by means of a transverse pin (17); this wooden shaft passes down through an opening (18) in the lid, which is closed by the collar (13) of the metal shaft. Upon the lower end of the wooden shaft is mounted a dasher or agitator (19). Through the center of the disk of agitator is an opening large enough to admit of a free motion of the lower section of the wooden shaft. Upon the upper and central portion of the arch (5) is the journal (25), upon which the miter gear (26) meshing with miter gear (14) revolves. This miter-wheel has a hub 8 inches long, providing a steady motion, and cannot be thrown out of gear with miter gear (14) when in motion. This miter-wheel (26) is cast with four nipples, two near the center (27) and two near its periphery (28), between which the actuating lever (30) is forced, the same being bolted to a brace connecting the spokes of the wheel. This gives an exceedingly firm and durable connection for the lever, which may be quickly attached or detached. Another improvement in this machine is the corrugated stave and bottom, which form a regular washboard all around and in the bottom of the machine. It is pointed out that in other machines the ribs that form the washboard are nailed to the sides and bottom, which is avoided in this machine, in which the corrugation is formed on the solid stave and bottom, giving the machine a chance to dry, and thus increasing its durability. Fig. 3 gives a view of the interior of the machine, illustrating this feature. Two sizes of these washers with corrugated staves are made, No. 2 being the large family size and No. 3 a smaller size for family use.

Florida orange growers predict that in a few years the States of Florida, Louisiana and California will be able to supply the entire demand for this delicious fruit. The pecuniary motive for engaging in orange culture is sufficiently strong, as appears from the fact that while an acre devoted to the culture of cotton will produce a crop worth \$50, a well-established orange grove will yield \$300 an acre at the low price of \$1 a box. George R. Fairbanks, president of the Florida Fruit Exchange, in an address before the American Pomological Convention, recently held at Ocala, said: "When we realize that more than one-fiftieth of the orange trees in Florida are bearing, we are amazed at the possible and probable future development of this industry." The present total domestic production is about 4,000,000 boxes, of which California and Louisiana furnish about one-quarter, and the imports from abroad amount to about 3,000,000 boxes in addition.

Among the departmental decisions of the Canadian Customs is one making the rate both on round iron galvanized rods and on galvanized bar iron 30 per cent.

Steel Spider.

The accompanying illustration represents an article put on the market by the Bronson Supply Company, corner of Lake and Coe streets, Cleveland, Ohio. It is the first of a line of steel hollow-ware for which they have adopted the trade-mark "Never Break" as applied to hollow-ware. These goods are described as stamped from

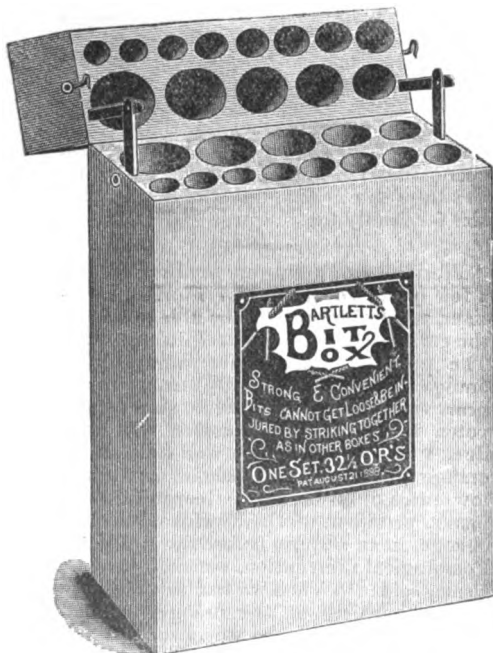


Steel Spider.

heavy cold-rolled pickled steel and finely finished. Besides the durability of these goods the point is also made that they are superior to the common goods, inasmuch as they are made from a homogeneous steel, which will not absorb the grease, and are therefore more cleanly and more easily cleaned after using. It is claimed that in cooking any article of food with them the absorption of the article cooking is impossible, thereby preventing imparting the taste of one kind of food to another, as is often the case when the vessel used for cooking is made from a material of a porous nature like cast iron. These spiders are made in the following sizes: 7, 8, 9, 10 and 12 inch. The prices at which they are sold are given in the Trade Report.

Bartlett's Bit Box.

The accompanying illustration represents this article, which is put on the market by Geo. H. Bartlett, 79 Chambers street, New York. This box, which is made of wood, has, it will be seen, holes in it to receive bits of the different sizes,



Bartlett's Bit Box.

the cut representing one adapted for a full set of 32 1/4 quarters. The hinges are, it will be observed, so constructed as to allow the cover to be raised clear of the shanks of the bits, and then tipped back. When the box is closed the jointed pieces of brass which constitute the hinges are inserted in the apertures made in the box

to receive them, so that the cover rests tightly on the box, where it is fastened by the hook shown. With this construction, if desired, the top of the box with the hinges can be entirely removed from the box, and replaced by simply reinserting brass bars. The points made in regard to this box are: That the bits are thoroughly protected and separated, so that they cannot get loose or come in contact

with one another; that there are no catches or springs to get out of order, and that the size of each bit is plainly stamped in the box. This is referred to as a convenience in actual use, as the location of any bit can be seen at a glance. These boxes are made to contain any assortment of bits desired, the following being the regular sizes: 4, 6, 8, 10, 12 and 16 sixteenths; 4, 5, 6, 8, 12, 14 and 16 sixteenths, and a full set of 32 1/4 quarters. These boxes are, we are advised, meeting with a demand from the jobbing trade, who by means of them are enabled readily to make up their own assortments.

Combined Ventilating and Check Rail Window Sash Lock.

White & McLure, Penn Building, Pittsburgh, Pa., for whom H. C. Mechling, 12 Cliff street, New York, is agent, are put-

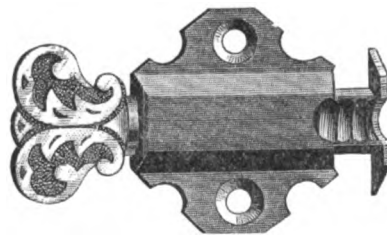


Fig. 1.

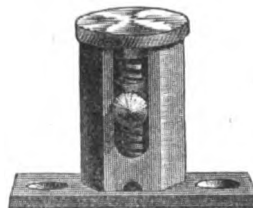


Fig. 2.

Holman's Combined Ventilating and Check Rail Window Sash Lock.

ting on the market the sash lock represented in the accompanying illustrations, Fig. 1 showing the part attached to the top or sides of lower sash and Fig. 2 the part attached to upper sash. The lock, Fig. 1, is operated by a slide and screw, the thumb piece of which is shown in the cut. This slide terminates with a flat butt end in which is a semicircle which engages with the sphere attached to the vertical screw, Fig. 2, the latter being adjustable to any height required. The manufacturers make the following points in regard to this lock: That it has an adjustable screw for any width of sash; that the lock can be used on either side of sash or on top of

lower sash and will lock the window at any desired point with safety; that by using the lock on top corner of lower sash the upper sash can be dropped and fastened, or the lower sash raised and the upper one dropped, thus giving ventilation to the room and securely locking the window; that this lock can be employed as a ventilator by the use of the adjustable screw, which can spread the sashes apart or draw them together; and that by its use rattling is prevented. The sash lock is made in Tucker and plain bronze, japan and nickel.

New Mail Box.

The Henry C. Hart Mfg. Company, Detroit, Mich., are offering to the trade the article illustrated herewith. By an ingenious arrangement pilfering from the box



New Mail Box.

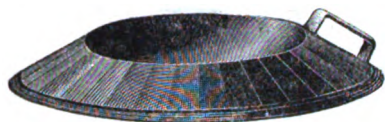
is prevented, as the hand cannot be inserted far enough into the slot to reach the mail deposited within. The box is of artistic design, and the point is made by the manufacturers that besides its utility the elegance of finish which is given to it makes it very ornamental. A spring lock with key is employed, and the opening is referred to as adjustable. The goods are made in antique brass and Saxon bronze, and are packed one dozen boxes in a case.

More than 105,000 people were carried to Washington over the Pennsylvania Railroad during the inauguration period and were delivered in Washington before noon of March 4. It took 210 trains of 10 cars each to convey this immense throng, with an average of 50 persons to a car. All trains were run in sections, and in many cases the number of sections to a given train reached ten. This is the largest number of people that the Pennsylvania Railroad have handled at any one time since the Constitutional Centennial in 1887, when it carried 175,000 people inside of a very few days. The revenue to the company from the inauguration travel will amount to \$500,000.

Proposals have been received in Montreal from the Allan steamship proprietors for the establishment of a Government line across the Atlantic, to run in connection with the Canadian Pacific Railway and the proposed fast line of steamers on the Pacific. It is stated by a member of the firm that the question involves an expenditure of \$5,000,000. At present the Allans are under a temporary agreement with the Government as to carrying mails.

The Electric Dust and Crumb Pan.

In the illustrations presented herewith we show two views of a combined dust and crumb-pan which is being offered the



Electric Dust and Crumb Pan.—Fig. 1.—Perspective View.

trade by Reardon & Ennis, of No. 311 River street, Troy, N. Y. Fig. 1 shows a perspective view of the device, while Fig. 2 presents the plan or top view. The shape of the article, as may be inferred from an inspection of the illustrations, is round, although the makers state that they are not confined to this particular form. It is provided with sloping sides, the angle being such as to allow the dust to be easily swept into the hollow receptacle at the center of the pan. The base is broad, rendering upsetting difficult, while the edges are so made as to prevent warping

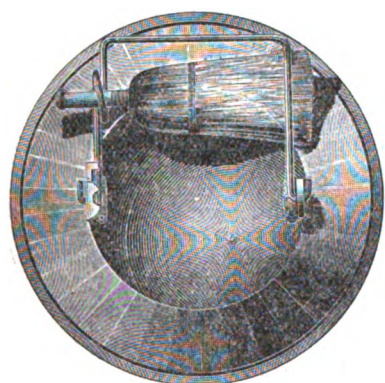
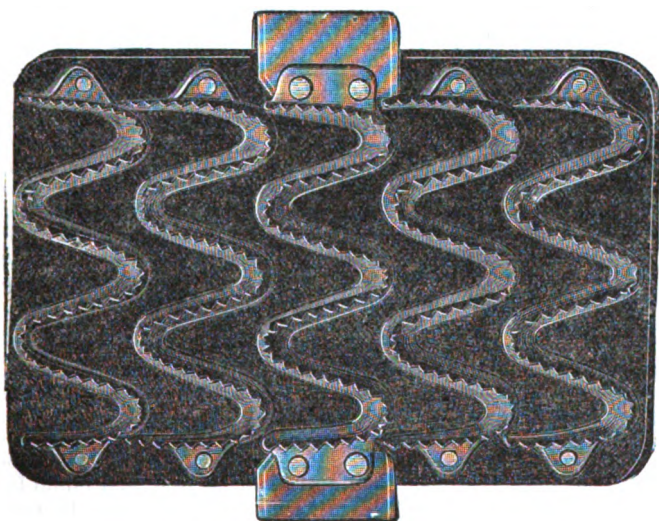


Fig. 2.—Plan or Top View.

or twisting out of shape. In use it may be pushed from place to place with the foot and held firmly when desired. By reference to the engraving, it will be seen



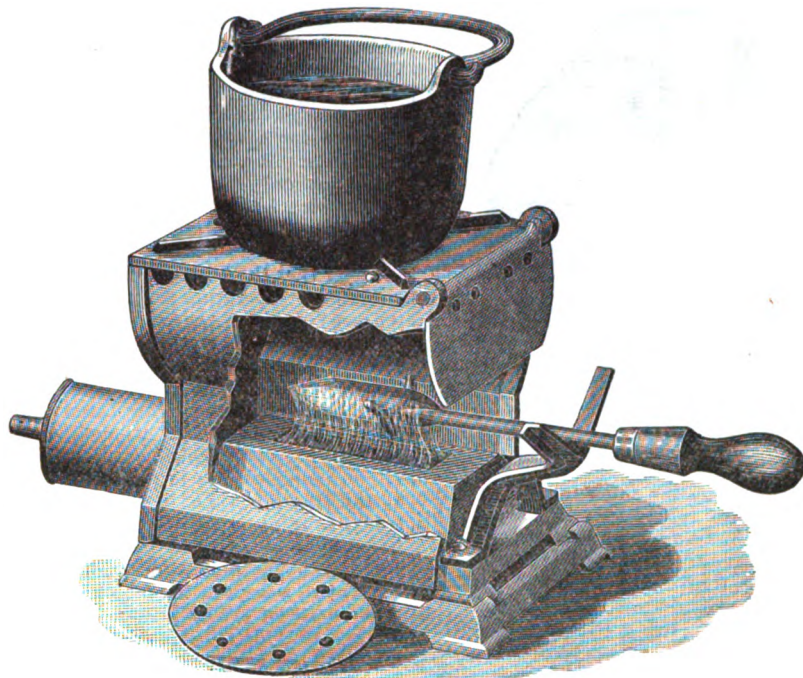
The Flexible Back Curry Comb.

that two styles of handles are employed, one made of wire, with a loop to hold a whisk-broom, and the other constructed of malleable iron and riveted to the side of the pan. The former style of handle is so made that it is capable of being locked into ears, holding in a vertical or horizontal position. In this form it is designed for use as a crumb-pan. The in-

tent of the manufacturers is to place these goods upon the market in a neat and attractive form and at prices which cannot fail to command attention. Patents covering the main features of construction are already pending.

The Flexible Back Curry Comb.

The accompanying illustration represents a new curry comb which has been brought out by the Freeport Hardware



Acme Gas Furnace.

Company, of Freeport, Ill., and is sold to the retail trade by Hibbard, Spencer, Bartlett & Co., of Chicago. It is made with a leather back, to which rows of iron teeth are riveted, as shown in the cut. This form of construction insures perfect flexibility, so that the comb can be used to advantage around the joints of animals, over their legs and in depressions in their bod-

comb." The retail dealer is thus provided with the means of calling attention to this new addition to his stock.

Acme Gas Furnace.

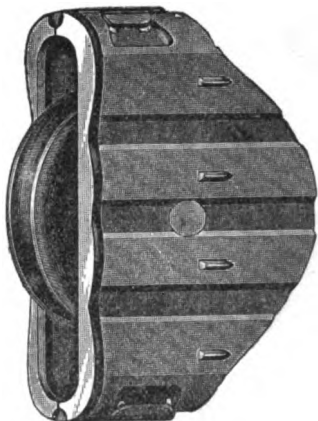
The Buffalo Dental Mfg. Company, of Buffalo, N. Y., are offering for tinner's use an improved form of furnace for heating solder coppers, a general view of which is shown in the accompanying engraving. A portion of the side of the furnace is

broken away, clearly indicating the position of the coppers when being heated. In the construction of the furnace the arrangement of parts is such that two flames issue horizontally from narrow slits, and, meeting under the soldering iron, envelop it as they rise. It will be noticed from an inspection of the cut that there is a clear space just below the iron, so that any solder dropping from the iron falls through the burner and is caught upon a tray placed below. By this means clogging of the burner is impossible. The furnace is almost wholly of cast iron, the top of the hood being flat and provided with a grid-hole for use in melting solder or heating articles to be soldered. The manufacturers state that either one or two irons may be heated at a time, as may be desired. The openings for the admission of air have been so arranged that the flame is protected from drafts, and the furnace may be used before an open window without the least trouble. The mixing tube is covered with a jacket, perforated below and opening into the interior of the hood. There is a slide on the mixing tube for the purpose of closing the air inlet when desired, and thus control the quality of the flame. The hood and jacket are locked on to the body of the burner, and secured by the nipple on which the rubber hose is slipped. The principal features of construction form the basis of a patent now pending.

An oil refining and shipping depot in connection with a new steamship line to Antwerp is being prepared in Philadelphia in anticipation of an extensive foreign trade. Wm. L. Elkins, of that city, is president, backed by capitalists in Pittsburgh who have at command \$1,000,000 for immediate use. There will be four piers 630 feet long and a double decked shed of almost equal length.

Ideal Sash Pulley No. 2.

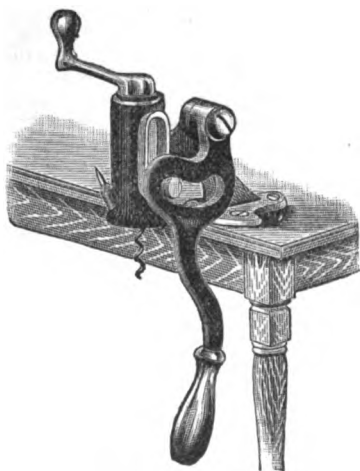
This sash pulley, shown in the illustration herewith given, is made by the Stover Mfg. Company, Freeport, Ill. The points made in regard to it are: That it has a cone bearing axle pulley, noiseless and free in operation, easily and quickly applied, requiring no screws or brads to hold it in place, and when in the frame making a perfect fit. It will be seen that there are lugs or projections on either side of the

*Ideal Sash Pulley No. 2.*

case for spacing the auger holes, and these lugs are also referred to as holding the pulley in the frame after it is applied, thus serving a double purpose. In applying the pulley four holes are bored with a $\frac{1}{8}$ inch bit on a straight line parallel with the parting groove, using the markers on the pulley case for locating the center of the holes. The pulleys are furnished either ground or unground wheels, and are packed in kegs of about 25 dozen and barrels of 125 dozen.

Enterprise Cork Puller.

The accompanying illustration represents this article, which is made by the Enterprise Mfg. Company, Philadelphia, Pa., for whom J. C. McCarty & Co., 97 Chambers street, New York, are agents, and shows the style in which it is made for attachment by screws to table, counter

*Enterprise Cork Puller.*

or other fixture. It is also made with a clamp, so as to be conveniently attached or detached as desired. The sliding barrel and both handles are described as nickel-plated. It is referred to as exerting great pulling power where the strain is greatest and as being simple and effective.

E. N. Robinson, general superintendent of the San Jacinto Tin Company, reports that an English Company has purchased the property and reorganized in London,

England, under the name of San Jacinto Syndicate, Limited. The capital stock is \$1,500,000. The syndicate bought all the property known as Rancho Sobriente de San Jacinto, near Riverside, in San Bernardino County, Cal. Under the management of the new company the tin mines on the ranch will be thoroughly developed.

An Electric Coal Cutter.

One of the newest and latest applications of electric power to mining work can be seen daily in operation at Mr. T. C. Heimes' Drane Colliery, near Osceola, Clearfield County, Pa. Here a most interesting application of motors for mining work has been devised by F. H. Lechner for operating a coal cutter by electricity. Mr. Lechner is well known as being not only the first inventor of coal-cutting machinery, but also the first to operate compressed air in mines for this purpose. It soon became evident to Mr. Lechner that the best results could only be obtained by operating the motor and cutter apart, as otherwise the size and weight of the cutter with the motor mounted upon it would prevent its easy transportation to the mine. In order to do this the following arrangement has been adopted in the mine before mentioned, and has proved very successful:

The motor, which is a 10 horse-power of the Sprague type, is mounted upon a truck, running upon rails, so that it can be easily handled and hauled from one position to another as occasion requires. The entire weight of the motor is less than 1000 pounds. The cutter operated by the motor, which in this case in the New Lechner, is set in position in the room to be cleared, and is connected with the motor by a $\frac{1}{4}$ -inch rope belt, running in V-shaped grooved sheaves, one being on the motor and the other on the cutter. This connection is long enough to allow the motor to be operated 30 feet away from the cutter, and has been set in a position in this mine 1600 feet away from the dynamo. The motor is held in position by guys at the point of use. By means of screw jacks that can be easily adjusted to any height with loose sheaves upon them the cutter can be operated from any angle from the motor, and the connection is made taut by moving the truck upon which the motor rests, and securing it in the right position by guys.

All mining engineers are familiar with the difficulty attending the working of the cutters in the limited space generally allotted them in mines, and how essential it is to have each machine divested of every pound of surplus weight. They also know what care must be exercised in moving it with great iron crowbars, to prevent injury to the more delicate parts of the mines, and however careful, how frequent it is that connecting-rods and other parts are so impaired that the machine has to be sent to the shop. Then how the rugged action of the engines shake everything loose on the machine, however firmly they may appear to be adjusted. All this is removed by the absence of the engines, the machine running as smoothly as a buzz-saw, and as a consequence, cutting with the same facility. By this plan three machines can be operated by one motor, for when one room is out the motor can at once be hauled to another room where a machine is in readiness and position, cut that room and pass to a third while the coal is being removed from the first two, and the cutters being again placed in position.

It was found, upon a preliminary trial of this apparatus at the Osceola mines, that by its use two men are able to excavate 100 tons in 10 hours, and that they can move the cutter as often as desired without any auxiliary aid. It has been

estimated that the cost of equipping a mine for the purposes of operating machinery with electricity is only about one-half the cost of equipping with compressed air, and the price of maintenance shows about the same proportion of saving.

Snow Armor.

In a recent official test at Frederikshal, Norway, of the virtues of snow for breastworks, one was constructed 20 m. long, 1.4 high, and 3 m. thick at the ground, sloping up to 1.5 or even 2 m. thick at top. It was made by the soldiers rolling large snowballs, putting them in a row, and then filling the interstices with snow packed tight by means of snow shovels, swords, bayonets, &c. Shots were fired from Garmann guns at a distance of only 50 m. Seven shots aimed at the upper portion, about 3 dm. below the top, went clean through, the thickness of the breastwork at the points of penetration varying from 1 to 1.58. Three aimed at about 0.6 or 0.7 below the top remained in the snow and were afterward dug out. It appeared that one of them penetrated to a depth of 1.25, another of 1.20, and a third to a depth of 1.23 only. The snow was quite free from fragments of ice; but the projectiles were all found to be flattened and broadened toward the front. At the time of the experiment, the thermometer stood at $+2^{\circ}$ C. Water was poured over the breastwork and next day it was found covered with a coating of ice. Ten shots were fired, but at a distance of 100 m., and with a result contrasting remarkably with the lesson of the day before. The snow wall was penetrable easily, and the shape of the projectiles was not altered. Seven of them went through where the intrenchment was about 1.59 to 1.63 m. thick, and they could not be found afterward. Of the other three projectiles, two were found at a distance of 8 m. behind the breastwork, and one immediately behind it. Evidently the mass became less compact, or more porous after the freezing, and was more easily penetrable. Colonel Hertzberg draws the conclusion, from the experiments, that if the face of the breastwork is not sloping, but the wall is made to have a minimum thickness of 2.50 m., a rampart of snow may defy any kind of projectiles fired from any distance.

Oil as Fuel.—At the convention of the National Electric Light Association, M. J. Francisco took up the subject of the use of oil as a fuel. He stated that during the past few months the following facts have been gleaned from an extensive correspondence on this subject with parties who are using liquid fuel. The Boston and Albany Railroad Company, after a careful test made in their shops by a Lehigh University professor, say that the cost of fuel is about the same. Though they purchase their coal in large quantities at one time and secure low rates, they prefer liquid fuel, because it is clean and requires no firemen, and gives a better supply of steam. Day, Cordage & Co., of Boston, claim that with Cumberland coal at \$4.50 per ton and liquid fuel at \$1.15 per barrel, they save 15 cents per 100 horse-power per hour, and the oil is preferable. The Fairbanks Scale Company, of Vermont, report that they find it a great saving over coal, while the boilers are heated evenly the entire length; also that the insurance companies have not increased their rates. T. P. Brown, manager of the Toledo, Columbus and Southern Railway, reports a saving of 33 per cent. of the price of coal by using liquid fuel; also that 2 barrels of oil equal 1 ton of soft coal, while manufacturers on his road find it only costs one-half as much as coal for their stationary boilers.

CURRENT HARDWARE PRICES.

MARCH 13, 1889.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers, at the figures named.

Ammunition.—

Cape, Percussion, 1000—	
Hicks & Goldmark's	
F. L. Waterproof, 1-10's.....	50¢
E. B. Trimmied Edge, 1-10's.....	55¢
E. B. Grnd. Edge, Cent. Fire, 1-10's.....	70¢
Double Waterproof, 1-10's.....	50¢
Market Waterproof, 1-10's.....	38¢
G. D.....	38¢
S. B.....	30¢
Union Metallic Cartridge Co.	
F. C. Trimmied.....	50¢
F. L. Ground.....	65¢
Cent. Fire Ground.....	70¢
DBL. Waterproof.....	1.10
DBL. Waterproof, in 1-10's.....	1.40
S. B. Genuine Imp.orted.....	54¢ @ 55¢
Eley's E. B.....	54¢ @ 55¢
Eley's D Waterproof, Central Fire.....	1.60

Cartridges.

Rim Fire Cartridges.....	50¢ & 52¢
Rim Fire Military.....	15¢ & 2¢
Cent. Fire, Pistol and Rifle.....	25¢ & 2¢
Cent. Fire, Military and Sporting.....	32¢ & 2¢
Blank Cartridges, except 22 and 32 cal., additional 10¢ on above discounts.	
Blank Cartridges, 22 cal., \$1.75.....	2¢
Blank Cartridges, 32 cal., \$3.50.....	2¢
Primed Shells and Bullets.....	15¢ & 2¢
B. B. Cape, Round Ball, \$1.75.....	2¢
B. B. Cape, Con. Ball, Swgd., \$2.00.....	2¢

Primers.

Berdan Primers, \$1.00.....	2¢
B. L. Cape (for Sturtevant Shells) \$1.00.....	2¢
All other Primers, \$1.20.....	2¢

Shells.

First quality, 4, 8, 10 and 12 gauge.....	25¢ & 10¢ & 2¢
First quality, 14, 16 and 20 gauge (\$10 list).....	30¢ & 10¢ & 2¢
Star, Club, Rival and Climax brands, 10 and 12 gauge.....	33¢ & 10¢ & 2¢
Club, Rival and Climax brands, 14 and 20 gauge.....	30¢ & 10¢ & 2¢
Selfbold's Comb. Shot Shells.....	15¢ & 2¢
Brass Shot Shells, 1st quality.....	60¢ & 2¢
Brass Shot Shells, Club, Rival, Climax.....	65¢ & 2¢
I X L, 10 and 12 gauge.....	40¢ & 5¢ & 2¢
"Special", 16 gauge.....	30¢ & 5¢ & 2¢
"Special", 10 and 12 gauge.....	40¢ & 10¢ & 2¢
Fowler's Pat.....	\$5.25

Shells Loaded.

A. M. Co. List No. 19, 1887.....	20¢ & 10¢
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Wads.

U. M. C. & W. R. A.—B. E., 11 up, \$2.00.....	2.00
U. M. C. & W. R. A.—B. E., 9&10.....	2.00
U. M. C. & W. R. A.—B. E., 7&8.....	2.00
U. M. C. & W. R. A.—B. E., 11 up, 3.10.....	3.10
U. M. C. & W. R. A.—B. E., 9&10.....	4.00
U. M. C. & W. R. A.—P. E., 7&8.....	4.00
Eley's B. E., 11 up.....	\$1.75
Eley's P. E., 11 up.....	2.80

Anvils.

Eagle Anvils, \$10.....	20¢ & 20¢ & 5¢
Peter Wright's.....	9¢ & 4¢
Armstrong's Mouse Hole.....	11¢ & 14¢
Armstrong's Mouse Hole, Extra.....	11¢ & 14¢
Tremont.....	9¢ & 4¢
Wilkinson's.....	9¢ & 4¢
J. & Riley Carr, Pat. Solid.....	11¢ & 11¢ & 4¢
Moore & Barnes Mfg. Co.....	33¢ & 4¢
Anvil Vice and Drill—	
Millers Falls Co., \$18.00.....	20¢
Cheney Anvil and Vice.....	25¢
Allen Anvil and Vice.....	\$3.00, dis 40¢ & 10¢

Apple Parers.

Advance.....	\$ doz \$4.75
Antrim Combination.....	\$ doz 5.50
Baldwin.....	\$ doz 7.25
Champion.....	\$ doz 7.25
Eureka, 1888.....	each 17.00
Family Bay State.....	\$ doz 12.00
Gem.....	\$ doz 5.25
Gold Medal.....	\$ doz 4.00
Hudson's New '88.....	\$ doz 3.75
Ideal.....	\$ doz 4.00
Improved Bay State.....	\$ doz 3.00
Little Star.....	\$ doz 5.00
Monarch.....	\$ doz 18.50
New Lightning.....	\$ doz 5.50
Orion.....	\$ doz 4.00
Penn.....	\$ doz 4.00
Perfection.....	\$ doz 4.00
Pomona.....	\$ doz 4.00
Rocking Table.....	\$ doz 4.50
Turtable.....	\$ doz 13.50
Victor.....	\$ doz 4.50
Waverly.....	\$ doz 4.50
White Mountain.....	\$ doz 4.25
78.....	\$ doz 5.75
78.....	\$ doz 6.50

Augers and Bits.

Douglas Mfg. Co.....	
Wm. A. Ives & Co.....	70¢
Humphreysville Mfg. Co.....	
French, Swift & Co. (F. H. Beecher).....	55¢
Cook's, Douglas Mfg. Co.....	55¢
Cook's, N. H. Copper Co. 50¢ & 10¢ & 50¢ & 10¢ & 50¢	
Ives Circular Lip.....	80¢
Patent Solid Head.....	80¢
C. E. Jennings & Co., No. 10, extension.....	10¢
Ip.....	
C. E. Jennings & Co., No. 30.....	60¢
C. E. Jennings & Co., Auger Bits, 7 set, 28 3/4 quarters, No. 5, 35; No. 30, \$3.50, 20¢	
Lewis' Patent Single Twist.....	45¢
Jennings' Augers and Bits.....	25¢
Imitation Jennings' Bits.....	60¢ & 60¢
Foght's Black.....	20¢
Car Bits.....	50¢ & 10¢ & 60¢
L. Hommedieu Car Bits.....	10¢ & 10¢
Forstner Pat. Aug Bits.....	10¢

Hollow Augers.

Ives'.....	25¢ & 10¢
French, Swift & Co.....	25¢ & 10¢ & 5¢
Douglas'.....	40¢ & 10¢
Bonney's Adjustable, 7 doz \$48.....	40¢ & 10¢
Stearns'.....	30¢ & 10¢
Ives' Expansive, each \$4.50.....	60¢ & 5¢
Universal Expansive, each \$4.50.....	20¢
Wood's.....	25¢ & 5¢ & 10¢

Expansive Bits.

Clarks' small, \$18; large, \$28.....	35¢ & 35¢ & 5¢
Ives' No. 4, 7 doz \$50.....	40¢
Swan's.....	40¢
Stearns, No. 1, \$20; No. 2, \$22.....	35¢
Stearns' No. 2, \$48.....	20¢

Gimlet Bits.

Common.....	\$ gross \$2.75 @ \$3.25
Diamond.....	\$ doz \$1.10..... 25¢ & 10¢
Bee.....	25¢ & 25¢ & 5¢
Double Cut, Shepardon's.....	45¢ & 5¢ & 5¢
Double Cut, Ct. Valley Mfg. Co.....	30¢ & 10¢
Double Cut, Hartwell's, 7 gro.....	85¢ & 25¢
Double Cut, Douglas'.....	40¢ & 10¢
Double Cut, Ives'.....	60¢ & 60¢ & 5¢

Bit Stock Drills.

Morse Twist Drills.....	50¢ & 10¢ & 5¢
Standard.....	50¢ & 10¢ & 5¢
Cleveland.....	50¢ & 10¢ & 5¢
Syracuse, for wood (wood list).....	30¢ & 30¢ & 5¢
Williams' or Holt's, for metal.....	50¢ & 10¢ & 10¢
Williams' or Holt's, for wood.....	40¢ & 10¢

Ship Augers and Bits.

L'Hommiedieu's.....	15¢ & 10¢ & 15¢ & 10¢ & 5¢
Watrous'.....	15¢ & 10¢ & 15¢ & 10¢ & 5¢
Snell's.....	15¢ & 10¢ & 15¢ & 10¢ & 5¢
Snell's Ship Auger Pat'n Car Bits.....	15¢ & 10¢ & 15¢ & 10¢ & 5¢

Awl Hafts.

Sewing, Brass Fer. 7 gr. \$3.50.....	45¢ & 10¢
Pat. Sewing, Short, \$1.00 7 doz.....	40¢ & 10¢
Pat. Sewing, Long.....	\$ doz \$1.20
Pat. Peg, Plain Top, 7 gr \$10.00.....	45¢ & 10¢
Pat. Peg, Leather Top, 7 gr \$12.00.....	45¢ & 10¢

Awls, Brad Sets, &c.

Awls, Sewing, Common 7 gr \$1.70, 35¢	
Awls, Should. Peg. 7 gr \$2.45, 40¢ & 40¢ & 10¢	
Awls, Pat. Peg.....	40¢ & 40¢ & 10¢
Awls, Shouldered Brad, 2.70 7 gr.....	35¢
Awls, Handled Brad, \$7.50 7 gr.....	45¢
Awls, Handled Scratch 7 gr, \$7.50, 35¢ & 10¢	
Awls, Socket Scratch 7 gr, \$15.00, 25¢ & 30¢	

Awl and Tool Sets.

Alken's Sets, Awls and Tools.....	55¢ & 10¢
No. 20, 7 doz \$10.00.....	55¢ & 10¢
Fray Adj. Tool Hds., Nos. 1, \$12; 2, \$18; 3, \$12; 4, \$9.....	25¢ & 25¢ & 10¢
Miller's Falls Adj. Tool Hds.....	25¢
Nos. 1, \$12; 2, \$18.....	
Henry's Combination Haft.....	\$ doz \$6.50
Brad Sets.....	
No. 42, \$10.50; No. 43, \$12.50.....	70¢ & 10¢ & 5¢
Stanley's Excelsior.....	
No. 1, \$7.50; No. 2, \$4.00; No. 3, \$5.50.....	30¢ & 10¢

Axes.

Makers' and Special Brands—	
First quality.....	\$ doz \$6.00 @ \$6.50
Others.....	\$ doz \$5.50 @ \$6.75

Axle Grease.

Fraser's, Keg 7 1/2 lb, Pall 7 1/2 lb 5¢	
Fraser's, in boxes.....	\$ gr \$9.50
Dixon's Everlasting, in bxs.....	\$ doz 1 1/2
Dixon's Everlasting.....	\$1.20; 2 lb \$2.00
Dixon's Everlasting.....	10 lb pails, ea 85¢
Lower grades, special brands.....	\$ gr \$5.50 @ \$7.00

Axles.

No. 1.....	4¢ @ 4 1/4¢, No. 2 5 1/4¢ @ 5 1/2¢
Nos. 7 to 14.....	55¢ & 5¢
Nos. 15 to 18.....	47¢ & 5¢
Nos. 19 to 22.....	70¢
National Tubular Self-Oiling Standard Farm (1 to 5) and Special Farm (A1 to A5).....	33¢ & 4¢
Less than 10 sets.....	33¢ & 4¢
Over 10 sets.....	33¢ & 4¢

Bag Holders.

Sprengle's Pat.....	\$ doz \$18..... 60¢
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Balances.

Spring Balances.....	50¢
Common 24 lb.....	\$ doz \$1.50..... 50¢
Chatillon's Spring Balances.....	50¢
Chatillon's Circular Spring Balances.....	60¢

Bells.

Hand.

Light Brass.....	70¢ & 10¢
Extra Heavy.....	60¢ & 10¢
White Metal.....	60¢ & 10¢ & 10¢
Silver China.....	33¢ & 10¢
Globe (Cone's Patent).....	25¢ & 10¢ & 35¢

Door.

Gong, Abbe's.....	33¢ & 4¢ & 10¢
Gong, Yankee.....	45¢ & 10¢
Gong, Barton's.....	40¢ & 10¢ & 50¢
Crank, Taylor's.....	25¢ & 10¢
Crank, Brooks'.....	50¢ & 10¢ & 2¢
Crank, Cone's.....	50¢ & 10¢ & 2¢

Crank, Connel's.....	20¢ & 10¢
Lever, Sargent's.....	60¢ & 10¢
Lever, Taylor's Bronzed or Plated.....	net
Lever, Taylor's Janned.....	25¢ & 10¢
Lever, R. E. M. Co.'s.....	50¢ & 10¢ & 2¢
Pull, Brook's.....	50¢ & 10¢ & 2¢
Pull, Western.....	25¢ & 10¢

Common Wrought.....	60¢ & 10¢
Western.....	20¢ & 10¢
Western, Sargent's list.....	70¢ & 10¢
Kentucky, "Star".....	20¢ & 10¢
Kentucky, Sargent's list.....	70¢ & 70¢ & 10¢
Dodge, Genuine Kentucky.....	50¢ & 10¢ & 50¢ & 10¢ & 5¢
Texas Star.....	40¢ & 40¢ & 5¢
Call.....	\$ doz \$3.4¢
Farm Bells.....	\$ doz \$3.4¢
Steel Alloy Church and School Bells.....	40¢

Bellows.

Blacksmith's.....	50¢ & 10¢ & 5¢ & 60¢
Molders'.....	40¢ & 40¢ & 10¢
Hand Bellows.....	40¢ & 10¢ & 50¢

Belting, Rubber.

Common Standard.....	70¢ & 10¢
Standard.....	70¢ & 70¢ & 10¢
Extra.....	60¢ & 5¢ & 60¢ & 10¢
N. Y. B. & P. Co., Carbon.....	60¢ & 10¢ & 5¢
N. Y. B. & P. Co., Diamond.....	50¢ & 10¢

Bench Stops.

Morrill's.....	\$ doz \$0..... 50¢
Hotchkiss's.....	\$ doz \$5, dis 10¢ & 10¢ & 10¢
Weston's, No. 1, \$10; No. 2, \$9.25.....	10¢ & 5¢
McGill's.....	\$ doz \$3..... 10¢

Bits.

Auger, Gimlet, Bit Stock, Drills, &c., see Augers and Bits.	
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Bit Holders.

Extension.....	\$ doz \$15.00..... 40¢ & 40¢ & 10¢
Ives'.....	\$ doz \$20.00..... 60¢ & 5¢ & 60¢ & 10¢
Diagonal.....	\$ doz \$24.00..... 40¢
Angular.....	\$ doz \$24.00..... 40¢ & 5¢

Blind Adjusters.

Domestic.....	\$ doz \$3.00, dis 33¢ & 4¢
Excelsior.....	\$ doz \$10.00..... 50¢ & 10¢ & 5¢
Washburn's Self-Locking.....	20¢ & 20¢ & 10¢

Blind Fasteners.

Mackrell's, 7 doz, \$1.00.....	30¢ & 20¢ & 10¢
Van Sand's Screw Pat., \$15 1/2 gr.....	60¢ & 10¢
Van Sand's Old Pat., \$15.00 7 gr.....	55¢ & 10¢
Washburn's Old Pattern.....	\$9.00 7 gr net
Merriman's.....	new list, net
Austin & Eddy No. 2008.....	\$9.00 7 gr net
Security Gravity.....	\$9.00 7 gr net

Blind Staples.

Barbed, 1/4 in. and larger.....	\$ doz 7 1/4¢ @ 8¢ net
Barbed, 3/4 in.....	\$ doz 8 1/4¢ @ 9¢ net

Blocks.

Cleveland Block Co., Mal. Iron.....	50¢
Moore's Novelty, Mal. Iron.....	50¢

Boils.

Door and Shutter.

Cast Iron Barrel, Square, &c.....	70¢ & 70¢ & 10¢
Cast Iron Shutter Bolts.....	70¢ & 70¢ & 10¢
Cast Iron Chain (Sargent's list).....	55¢ & 10¢
Ives' Patent Door Bolts.....	60¢
Wrought Barrel.....	70¢ & 70¢ & 10¢
Wrought Square.....	70¢ & 70¢ & 10¢
Wrt Shutter, all Iron, Stanley's.....	60¢ & 10¢
Wrt Shutter, Brass Knob.....	40¢ & 10¢
Wrt Shutter, Sargent's list.....	60¢ & 10¢
Wrt Sunk Flush, Sargent's list.....	55¢ & 10¢
Wrt Sunk Flush, Stanley's list.....	50¢ & 10¢
Wrt B.K. Flush, Com'n.....	55¢ & 10¢

Carriage, Machine, &c.

Com. list June 10, '84.....	75¢ & 10¢ & 5¢
Genuine Eagle, list Oct. '84.....	75¢ & 10¢
Phila. pattern, list Oct. '84.....	75¢ & 10¢ & 5¢
R.B. & W., old list.....	70¢
Machine, according to size.....	75¢ & 10¢ & 80¢
Bolt Ends, according to size.....	75¢ & 10¢ & 80¢

Tire.

Common, list Feb. 28, '83.....	70
Portchester Bolt and Nut Company:	
Empire, list Feb. 28, '83.....	70
Phila., list Oct. '84.....	82 1/2
Keystone, Philadelphia, list Oct. '84.....	80
Norway, Phila., list Oct. '84.....	75 1/2
American Screw Company:	
Norway, Phil., list Oct. 16, '84.....	75 1/2
Eagle, Phil., list Oct. 16, '84.....	80
Philadelphia, list Oct. 16, '84.....	82 1/2
Bay State, list Feb. 28, '83.....	70
R.B. & W., Philadelphia, list Oct. 16, '84.....	80
R. & E. Mfg. Co.....	80

Cards—

Horse & Curry.....10x10@10x10@10x
Cotton.....New list, Aug., 1883,
10x10@10x
Wool.....New list, Aug., 1883,
10x10@10x

Carpet Stretchers—

Cast Steel, Polished.....\$ doz \$2.25
Cast Iron, Steel Points.....\$ doz 30¢
Socket.....\$ doz \$1.75
Bullard's.....25x25@10x

Carpet Sweepers—

Bissell No. 5.....\$ doz \$17.00
Bissell No. 7 New Drop Pan.....\$ doz \$19.00
Bissell, Grand.....\$ doz \$36.00
Grand Rapids.....\$ doz \$24.00
Crown Jewel, No. 1, \$18.00; No. 2,
\$19.00; No. 3, \$20.00
Magic.....\$ doz \$15.00
Jewel.....\$ doz \$17.00
Improved Parlor Queen, Nickle-
doz \$27.00
Improved Parlor Queen, Japanned
doz \$24.00

Excelsior.....\$ doz \$22.00
Garland.....\$ doz \$18.00
Parlor Queen.....\$ doz \$24.00
Housewife's Delight.....\$ doz \$15.00
Queen.....\$ doz \$16.00
Queen, with band.....\$ doz \$18.00
King.....\$ doz \$30.00
Weed, Improved.....\$ doz \$18.00
Hub.....\$ doz \$16.00
Cog-Wheel.....\$ doz \$22.00
Conqueror.....\$ doz \$22.00
Easy.....\$ doz \$22.00
Monarch.....\$ doz \$22.00
Goshen.....\$ doz \$21.00
Advance.....\$ doz \$18.00
Ladies' Friend, No. 1, \$ doz, \$15.00;
No. 2, \$ doz, \$16.00
American.....\$ doz \$15.00
Grand Republic.....\$ doz \$35.00

Cartridges—

See Ammunition.

Casters—

Bed.....New list:
Plate.....Brass.....55x55@5x5
Shallow Socket.....Others.....60x60@5x5
Deep Socket.....40x12
Yale Casters, list May, 1884.....30x10@4x4
Yale, Gem.....60x60@5x5
Martin's Patent (Phoenix).....45x10@5x5
Payson's Anti-friction.....60x60@10x10
Giant Truck Casters.....30x
Stationary Truck Casters.....50x10
Socket Truck Casters.....50x

Cattle Leaders—

Humason, Beckley & Co.'s.....70x
Sargent's.....60x10
Hotchkiss.....30x
Peck, Stow & W. Co.....50x10x

Chain—

Trace, 6x10-2, exact,
\$ pair, \$1.03.....50x10@50x10@5x5
Trace, 6x10-3, exact,
\$ pair \$2.4.....50x10@50x10@5x5
Trace, 7-10-2, exact,
\$ pair \$1.11.....50x10@50x10@5x5
NOTE.—Traces, "Regular" sizes, 3¢ net
\$ pair less than exact.
Log, Fifth, Stretcher, and other fancy
Chains, list Nov. 1, 1884
50x10@50x10@5x5

American Coil, in cask lots,
5-18 14 5 5 3 4
\$8.75 6.25 5.00 4.50 4.40 4.00 3.75 3.50
Less than cask lots, add 1/4¢ @ 1/2¢
German Coil, list of June 20, 1887
50x10@50x10@5x5

German Halter Chain, list of June 20,
1887.....50x10@50x10@5x5
Covert Halter, Hitching and Breast
50x2x2
Covert Traces.....35x2x2
Oneida Halter Chain.....60x60x5x5
Galvanized Pump Chain.....\$ doz \$6.00
Jack Chain, Iron.....75x75x5x5
Jack Chain, Brass.....70x70x5x5

Chalk—

White.....\$ gr 50¢
Red.....\$ gr 70¢
Blue.....\$ gr 85¢
White Crayons, \$ gr 12¢ @ 12 1/2¢.....10x

Chalk Lines—

See Lines.

Chisels—

Socket Framing and Firmer.
P. S. & W.....
New Haven.....
Wetherby.....75x5@75x10x
Mix.....
Ohio Tool Co.....
Douglass.....75x75@5x5
Buck Bros.....30x
Merrill.....60x10@60x10@5x5
L. & I. J. White.....30x30x5x5
Tanged and Miscellaneous.
Tanged Firmer.....40x10x
Butcher's.....\$1.75@85.00
Spear & Jackson's.....\$5 to 2
Buck Bros.....30x
Cold Chisels, \$ doz.....10x10x

Chucks—

Beach Pat.....each, \$8.00.....20x
Morse's Adjustable, each, \$7.00, 20x20@5x5
Danbury.....each, \$8.00, dis 30x30@5x5
Syracuse, Balz Pat.....25x

Clamps—

Providence Tool Co.'s Wrought Iron.....25x
Adjustable, Gray's.....20x
Adjustable, Lambert's.....20x
Adjustable, Snow's.....40x5x5
Adjustable, Hammers.....15x
Adjustable, Stearns.....20x10x
Stearns's Adjustable Cabinet and Cor-
ner.....20x10x
Cabinet, Sargent's.....60x10x
Carriage Makers, Sargent's.....70x10x
Eberhard Mfg. Co.....40x5@40x10@5x5
Warner's.....40x10@40x10@5x5
Saw Clamps, see Vises

Clips—

Norway, 2-1c, 1 1/2 5-6.....55x5x5x5
2nd grade Norway Axle, 1/4 & 5-16.....65x5x5
Superior Axle Clips.....60x5x5@60x5x5x5

Norway Spring Bar Clips, 5-16.....60x5x5x5
Wrought-Iron Fellow Clips.....\$ doz, 5 1/2¢
Steel Fellow Clips.....\$ doz, 5¢
Baker Axle Clips.....25x

Cockeyes—

Cocks, Brass.

Hardware list.....40. & 10x2x2

Coffee Mills—

Box and Side, list Jan. 1, 1888.....50x2x2
American, Enterprise Mfg Co. 25x10@30x
The Swift, Lane Bros.....20x10x

Compasses, Dividers, &c—

Compasses, Calipers, Dividers, 70x70@10x
Bemis & Call Co.'s.....60x5x5
Dividers.....60x5x5
Compasses & Calipers.....50x5x5
Wing and Inside or Outside.....50x5x5
Double.....60x
(Call's Pat. Inside).....30x
Excelsior.....60x
J. Stevens & Co.'s.....25x10x
Sturtevant's
Spring Calipers and Dividers 25x10@10x
Lock Calipers and Dividers.....25x10x
Combination Dividers.....25x10x

Coopers' Tools—

Bradley's.....20x
Bartons.....30x20x5x5
L. & I. J. White.....20x5x5
Albertson Mfg. Co.....25x
Beatty's.....40x10@5x5
Sandusky Tool Co.....30x30x5x5

Corkscrews—

Humason & Beckley Mfg. Co. 40x40@10x
Clough's Pat.....33 1/2x33 1/2@5x5
Howe Bros & Hulbert.....35x

Cork Knives and Cutters—

Bradley's.....10x
Wadsworth's.....25x

Cradles—

Grain.....50x2x2

Crow Bars—

Cast Steel.....\$ doz 4¢
Iron, Steel Points.....\$ doz 3 1/2¢

Curry Combs—

Fitch's.....50x10@50x10@10x
Rubberper doz \$10.00.....20x
Perfect.....50x

Curtain Pins—

Silvered Glass.....net
White Enamel.....net

Cutlery—

Beaver Falls & Booth's.....33 1/2
Wostenholme.....\$7.75 to 2

Dampers, &c—

Dampers, Buffalo.....50x
Buffalo Damper Clips.....50x
Crown Damper.....40x
Excelsior.....40x10x

Dividers—

See Compasses.

Dog Collars—

Embossed, Gilt, Pope & Steven's list
30x10x
Leather, Pope & Steven's list.....40x
Brass, Pope & Steven's list.....40x

Door Springs—

Torrey's Rod, regular size.....\$ doz \$1.30
Gray's, \$ gr., \$20.00.....20x
Bee Rod \$ gr., \$20.00.....20x
Warner's No. 1, \$ doz, \$2.50; No. 2,
\$3.30.....40x10@50x
Gem (Coil), list April 19, 1886.....10x
Star (Coil), list April 19, 1886.....20x
Victor (Coil).....60x60@10x
Champion (Coil).....60x10@60x10@10x
Philadelphia, 5 in., \$5.00; 8 in., \$7.75;
Cowell's.....No. 1, \$ doz, \$18.00; No. 2,
\$15.00.....50x
Rubber, complete, \$ doz, \$4.50.....35x10x
Hercules.....60x
Shaw Door Check and Spring, 25x30x35x

Drawing Knives—

Wetherby.....75x5@
P. S. & W.....75x10x
Mix.....
New Haven.....
Merrill.....60x10@60x10@5x5
Douglass.....75x75@5x5
Watrous.....15x10@25x
L. & I. J. White.....20x5x5
Bradley's.....35x
Adjustable Handle.....25x33 1/2x
Wilkinson's Folding.....25x25x5x5

Drills and Drill Stocks—

Blacksmiths'.....each \$1.75
Blacksmiths' Self-Feeding, each \$7.50, 20x
Breast, P. S. & W.....40x10x
Breast, Wilson's.....30x5x5
Breast, Millers Falls, each \$3.00, dis 25x
Breast, Bartholomew's, each \$2.50, dis
25x10x40x
Ratchet, Merrill's.....20x20x5x5
Ratchet, Ingersoll's.....25x
Ratchet, Parker's.....20x20x5x5
Ratchet, Whitney's.....20x10x
Ratchet, Weston's.....20x25x
Ratchet, Moore's Triple Action.....25x30x
Whitney's Hand Drill, Plain, \$11.00;
Adjustable, \$12.00.....20x10x
Wilson's Drill Stocks.....10x
Automatic Boring Tools.....\$1.75@81.85

Twist Drills—

Morse.....50x10@5x5
Standard.....50x10@5x5
Syracuse.....60x10@5x5
Cleveland.....50x10@5x5
Williams.....50x10@10x

Drill Bits.—See Augers and Bits.**Drill Chucks.—See Chucks.****Dripping Pans—**

Small sizes.....\$ doz 6 1/2¢
Large sizes.....\$ doz 6 1/2¢

Egg Beaters.

Dover.....\$ doz \$1.50
National.....\$ doz \$4.50
Family (T. & S. Mfg. Co.), \$ gro \$17.00@
\$18.00
Duplex (Standard Co.).....\$ gro \$15.00
Rival (Standard Co.).....\$ gro \$12.00
Large Duplex (Standard Co.), \$ doz \$4.50
Triumph (T. & S. Mfg. Co.), \$ gro \$10.50
@ \$11.50

Advance, No. 1.....\$ gro \$10.50
Advance, No. 2.....\$ gro \$10.00
Bryant's.....\$ gro \$15.00
Ayres's Spiral.....\$ gro \$5.00
Double (H. & R. Mfg. Co.).....\$ gro \$10.20
Easy (H. & R. Mfg. Co.).....\$ gro \$14.00
H. & R. Mfg. Co., \$ gro \$12.20
Spiral (H. & R. Mfg. Co.).....\$ gro \$4.50
Palme, Diehl & Co.'s.....\$ gro \$24.00

Egg Poachers—

Buffalo Steam Egg Poachers, \$ doz, No.
1, \$8.00; No. 2, \$9.00.....25x

Electric Bell Sets.—

Wollensak's.....20x
Bigelow & Dowse.....20x

Emery—No. 4 to No. 54 to Flour, CF

46 gr. 150 gr. F FF.
Kegs, \$ doz.....4 1/2¢ 5 1/2¢ 2 1/2¢
1/2 Kegs, \$ doz.....4 1/2¢ 5 1/2¢ 2 1/2¢
4 Kegs, \$ doz.....4 1/2¢ 5 1/2¢ 2 1/2¢
10-lb cans, 10.....6 1/2¢ 5 1/2¢
In case.....6 1/2¢ 5 1/2¢
10-lb cans, less
than 10.....10 1/2¢ 7 1/2¢

Enameled and Tinned Ware—

See Hollow-Ware.

Escutcheon Pins—

Iron, list Nov. 11, 1885.....50x10@50x10@5x5
Brass.....60x60@5x5

Escutcheons.

Door Lock.....Same dis as Door Locks.
Brass Thread.....60x60@10x
Wood.....25x

Faucets.—

Fenn's.....40x
Bohren's Pat. Rubber Ball.....25x
Fenn's Cork Stops.....33 1/2x
Star.....60x
Frary's Pat. Petroleum.....40x5x2x2
B. & L. B. Co.....
Star, Metal Plug, new list.....40x
Lockport, Metal Plug, reduced list.....60x
Metallic Key, Leather Lined.....60x10@
60x10@10x
Cork Lined.....70x5@70x10x
Burnside's Red Cedar.....50x
Burnside's Red Cedar, bbl lots.....50x10x
John Sommers'.....
Peerless Best Block Tin Key.....40x
IXL, 1st quality, Cork Lined.....50x
Diamond Lock.....40x
Perfection, Fla. Red Cedar.....50x
Goodenough Cedar.....50x
Bos Metal Plug.....60x
Reliable Cork Lined.....60x
Western Pattern Cork Lined.....50x
Self-Measuring.....
Enterprise, \$ doz \$50.00.....20x10x
Lane's, \$ doz \$36.00.....25x10x
Victor, \$ doz \$36.00.....25x10x

Fellow Plates.—

Derby and Cincinnati.....45x5x5

Files—

Domestic.....
Nicholson Files, Rasps, &c.....60x10@60x
10x5x5
Nicholson (X. F.) Files.....25x
Nicholson's Royal Files (Seconds).....75x
(extra prices on certain sizes)
Other makers, best brands.....60x10@60x10@10x
Fair brands.....60x10@60x10@70x
Second quality.....70x10@75x10x
Nicholson's Horse Rasps.....60x10@60x
10x5x5
Heller's Horse Rasps.....50x7 1/2@50x10x
McCaffrey's Horse Rasps.....50x10x

Fluting Machines—

Knox, 4 1/2-inch Rolls.....\$3.25 each 35x
Knox, 6-inch Rolls.....\$3.60 each 35x
Eagle, 3 1/2-inch Roll, \$2.15.....35x
Eagle, 5 1/2-inch Roll, \$2.85.....35x
Crown, 4 1/2 in., \$3.50; 6 in., \$4.00; 8 in.,
\$6.50 each.....35x
Crown Jewel, 6 in.....\$3.50 each, 35x
American, 5 in., \$3.00; 6 in., \$3.40; 7 in.,
\$4.50 each.....25x
Domestic Fluter.....\$1.50 each net
Geneva Hand Fluter, White Metal,
\$ doz \$12, dis 25x
\$12.50; 3, \$10.00.....30x
Shepard Hand Fluter, No. 85.....\$15.30
Shepard Hand Fluter, No. 110 \$ doz
\$11.00.....40x
Shepard Hand Fluter, No. 95 \$ doz
\$8.00.....40x
Clark's Hand Fluter, \$ doz \$15.00.....35x
Combined Fluter and Sad Iron,
\$ doz \$15.00.....30x
Buffalo.....\$ doz \$10.00.....10x

Fluting Scissors—

Blair's.....\$ doz \$2.00
Blair's "Climax".....\$ doz \$1.35

Fodder Squeezers—

Blair's.....\$ doz \$2.00
Blair's "Climax".....\$ doz \$1.35

Forks—

Hay, Manure, &c., Asso. List.....65x
Hay, Manure, &c., Phila. List.....60x60@5x5
Plated, see Spoons.

Freezers, Ice Cream—

Buffalo Champion.....60x10@5x5
Shepard's Lightning.....65x
White Mountain.....60x

Fruit and Jelly Presses—

Enterprise Mfg. Co.....20x10@30x
Henis.....\$ doz \$3.75@4.00
P. D. & Co.....\$ doz \$3.75@4.00
Shepard's Queen City.....40x

Fry Pans—

High List.....75x5@75x10
No.....0 3 4
\$ doz, \$3.75 \$4.70 \$5.30 \$5.95 \$6.55
No.....5 6 7 8
\$ doz.....\$7.50 \$8.75 \$10.00 \$11.25
Low List.....65x10@
No.....0 1 2 3 4
\$ doz, \$3.00 \$3.75 \$4.25 \$4.75 \$5.25
No.....5 6 7 8
\$ doz.....\$6.00 \$7.00 \$8.00 \$9.00

Fuse—

Common Hemp Fuse, for dry ground, \$2.70
Common Cotton Fuse, for dry ground 2.85
Single Taped Fuse, for wet ground.....4.75
Double Taped Fuse, for very wet gr. 6.00
Triple Taped Fuse, for very wet gr. 7.25
Small Gutta Percha Fuse, for water, 7.50
Large Gutta Percha Fuse, for water, 12.00

Gauges—

Marking, Mortise, &c.....60x10x
Starrett's Surface, Center and Scratch,
25x10x
Wire, low list.....10x10x
Wire, Wheeler, Madden & Co.....10x
Wire, Morse's.....50x50@5x5
Wire, Brown & Sharpe's.....10x20x

Gimlets—

Nail and Spike.....50x10@5x5
"Eureka" Gimlets.....40x10x
"Diamond" Gimlets.....\$ gr \$5.00
Double Cut, Shepardson's.....45x45@5x5
Double Cut, Ives'.....60x60@5x5
Double Cut, Douglass'.....40x10x
"Bee," \$ gr \$12.....25x25@5x5

Glue—

Le Page's Liquid.....25x25@5x5
Upton's Liquid.....35x
Le Page & Co.'s Improved Process
25x25@5x5

Glue Pots—

Tinned.....40x
Enameled.....40x5x5
Family, Howe's "Eureka".....40x
Family, L. F. C.'s "Handy".....50x

Grindstones—

Small, at factory.....\$ ton \$7.50@9.00

Grindstone Fixtures—

Sargent's Patent.....70x10x
Reading Hardware Co.....30x10x

Hack Saws.—

See Saws.

Halters—

Covert's Rope, 1/2-in. Jute.....50x2x2
Covert's Rope, 1/2-in. Hemp.....40x2x2
Covert's Adj. Rope Halters.....40x2x2
Covert's Hemp Horse and Cattle Tie,
50x2x2
Covert's Jute Horse and Cattle Ties,
60x10@2x2

Hammers—

Handled Hammers—
Maydole's, list Dec. 1, '85.....25x25@10x
Buffalo Hammer Co. (List Jan. 15, '87)
Humason & Beckley.....50x50@10x
Atha Tool Co.....40x10@50x
Fayette R. Plumb.....40x10@50x
C. Hammond & Son.....40x10@50x
Verree.....50x
Magnetic Tack, Nos. 1, 2, 3, \$1.25, 1.50 &
1.75.....30x10x
Nelson Tool Works.....40x10x
Warner & Nobles.....20x25
Peck, Stow & Wilcox.....33 1/2x
Sargent's.....33 1/2x10x

Heavy Hammers and Sledges—

3 lb and under.....\$ doz 40¢ 60x10
3 to 5 lb.....\$ doz 36¢ \$10 @ 70¢
Over 5 lb.....\$ doz 30¢
Wilkinson's Smiths.....10x6@11x6

Handcuffs and Leg Irons—

Providence Tool Co., Handcuffs, \$15.00
\$ doz.....10x
Providence Tool Co., Leg Irons, \$25.00
\$ doz.....10x
Tower's.....25x
Daley's Improved Handcuffs: 2 Hands,
Polished, \$ doz \$48.00; Nickle-
d, \$57.00; 3 Hands, Polished, \$ doz
\$72.00; Nickleled, \$84.00.....25x

Handles—

Iron, Wrought or Cast—
Door or Thumb.
Nos.....0 1 2 3 4
Per doz.....\$0.90 1.00 1.18 1.35 1.50
60x10@10x

Roggin's Latches.....\$ doz 30¢@35¢
Bronze Iron Drop Latches.....\$ doz 70¢ net
Jap'd Store Door Handles—Nuts, \$1.00;
Plate, \$1.10; no Plate, \$0.88.....net
Barn Door, \$ doz \$1.40.....10x10x
Chest and Lifting.....70x

Handles, Wood—

Saw and Plane.....40x10@40x10@5x5
Hammer, Hatchet, Axe, Sledge, &c.....40x
Brad Awl.....\$ gr \$2.00
Hickory Firmer Chisel, ass'd, \$ gr 4.50
Hickory Firmer Chisel, large, \$ gr 5.00
Apple Firmer Chisel, ass'd, \$ gr 5.00
Apple Firmer Chisel, large, \$ gr 6.00
Socket Firmer Chisel, ass'd, \$ gr 3.00
Socket Firmer Chisel, large, \$ gr 3.00
J. S. Smith & Co.'s Pat File.....50x
File, assorted.....\$ gr 2.75; dis 40¢
Auger, assorted.....\$ gr 7.00; 40x10x
Auger, large.....\$ gr 5.00.....30x10x
Pat. Auger, Ives'.....\$ gr 1.25 net
Pat. Auger, Swain.....\$ gr 1.25 net
Hoe Rake, Shovels &c.....50x1x

Cross-Cut Saw Handles—
 Atkins' No. 1 Loop, pair, 30¢; No. 3, 2¢; No. 2 and No. 4 Reversible, 2¢.
 Boynton's Loop Saw Handles, 50¢; 60¢
 Champion..... 15¢

Hangers—
 Barn Door, old patterns..... 60¢10¢10¢70¢
 Barn Door, New England..... 60¢10¢10¢70¢
 Barnson Steel Anti-Friction..... 55¢
 Orleans Steel..... 55¢
 Hamilton Wood Track..... 55¢
 U. S. Wood Track..... 55¢
 Champion..... 60¢10¢
 Rider and Wooster, Medina Yfg. Co.'s
 List..... 70¢
 Climax Anti-Friction..... 60¢
 Climax Anti-Friction for Wood Track..... 55¢
 Zenith for Wood Track..... 55¢
 Reed's Steel Arm..... 50¢
 Challenge, Barn Door..... 50¢
 Sterling's Imp'ed (Anti-Friction)..... 55¢10¢
 Victor, No. 1, \$15.00; No. 2, \$15.50; No. 3, \$18.00..... 50¢2¢
 Cheritree..... 60¢10¢
 Kidder's..... 60¢10¢
 The Boss..... 60¢10¢
 Best Anti-Friction..... 60¢10¢
 Duplex (Wood Track)..... 60¢10¢5¢
 Terry's Pat., pair, 4 in. \$10.00; 5 in. \$12.00..... 50¢5¢50¢10¢
 Cronk's Pat., No. 4, \$12.00; No. 5, \$14.40; No. 6, \$18.00..... 50¢15¢60¢
 Wood Track Iron Clad, pair, 10 ft..... 15¢60¢5¢
 Carrier Steel Anti-Friction..... 50¢5¢50¢
 Architect, pair, set \$6.00..... 20¢
 Eclipse..... 20¢10¢
 Felix, pair, set \$4.50..... 20¢
 Richards..... 30¢60¢10¢
 Lane's Steel Anti-Friction..... 40¢10¢
 Ball Bearing Door Hanger..... 30¢10¢25¢10¢
 Warner's Pat..... 20¢20¢10¢
 Stearns' Anti-Friction..... 20¢20¢10¢
 Stearns' Challenge..... 25¢10¢25¢10¢10¢
 Faultless..... 40¢40¢5¢
 American, pair, set \$6.00..... 20¢10¢
 Rider & Wooster, No. 1, 62¢; No. 2, 75¢..... 40¢
 Paragon, Nos. 1, 2 and 3..... 40¢10¢
 Paragon, Nos. 5, 6, 7 and 8..... 20¢10¢
 Crescent..... 60¢60¢10¢
 Nickel, Cast Iron..... 50¢
 Nickel, Malleable Iron and Steel..... 40¢
 Scranton Anti-Friction Single Strap..... 35¢
 Scranton Anti-Friction Double Strap..... 40¢
 Universal Anti-Friction..... 40¢
 Wild West, 4 in. Wheel, \$15.00; 5 in. Wheel, \$21.00..... 45¢
 Star..... 40¢10¢40¢10¢5¢
 May..... 50¢5¢60¢10¢
 Barry, \$6.00..... 40¢10¢

Harness Snaps—
 See Snaps.
Hatchets—
 List Jan. 1, 1886..... 35¢40¢
 Isaiah Blood..... 40¢5¢
 Hunt's Shingling, Lath and Claw..... 40¢5¢
 Hunt's Broad..... 40¢
 Buffalo Hammer Co..... 40¢10¢50¢
 Hurd's..... 40¢10¢50¢
 Fayette R. Plumb..... 40¢10¢50¢
 Wm. Mann, Jr., & Co..... 50¢5¢5¢
 Underhill Edge Tool Co..... 40¢5¢60¢10¢
 Underhill's, Haines and Bright..... 35¢45¢
 C. Hammond & Son..... 40¢10¢50¢
 Simmons..... 40¢10¢50¢
 Peck's..... 40¢10¢50¢10¢5¢
 Kelly's..... 50¢50¢5¢
 Sargent & Co..... 50¢50¢5¢
 Ten Eyck Edge Tool Co..... 40¢10¢50¢10¢5¢
 Collins..... 10¢

Hay and Straw Knives—
 Lightning, Mfrs' price \$18.00, 25¢
 But jobbers frequently give extras.
 Gem..... pair, \$10
 Wadsworth's..... 40¢75¢10¢10¢
 Carter's Needle..... pair, \$11.50, \$14.00
 Heath's..... pair, \$13.50, \$14.00
 Auburn Hay, Com. and Spear Point..... 50¢
 Auburn, Straw..... 40¢
 Nollin's Hay..... pair, \$10.00

Hinges—
Wrought Iron Hinges
 Strap and T..... 75¢75¢5¢
 Screw Hook and Strap..... 14 to 20 in., pair, 3¢; 22 to 30 in., pair, 2¢4¢
 Heavy Welded Hook..... 14 to 20 in., pair, 3¢4¢; 22 to 30 in., pair, 2¢4¢
 Screw Hook and Eye..... 14 in., pair, \$1.50; 16 in., pair, \$2.45; 18 in., pair, \$3.80..... 10¢
 Rolled Blind Hinges, Nos. 32 and 34..... 50¢10¢
 Rolled Blind Hinges, Nos. 232 and 234..... 55¢10¢
 Rolled Plate..... 70¢10¢
 Rolled Plates..... 70¢10¢
 Plate Hinges, 8, 10 & 12 in., pair, 4¢
 "Providence" over 12 in., pair, 4¢
Spring Hinges—
 Geer's Spring and Blank Butts..... 40¢
 Union Spring Hinge Co.'s list, March, 1886..... 20¢
 Acme and S..... 30¢
 Empire and Crown..... 20¢
 Hero and Monarch..... 50¢
 American, Gem, and Star, Japanned..... 20¢
 American, Gem, and Star, Bronzed..... net
 Oxford, Bronze and Brass..... net
 Barker's Double Acting..... 20¢10¢
 Union Mfg. Co..... 25¢
 Bommer's..... 30¢
 Beckman's..... 15¢20¢
 Chicago..... 30¢
 Wilco..... 10¢
 Devore's..... 40¢
 Rex..... 40¢
 Royal..... 40¢
 Reliable..... 60¢
 Champion..... 60¢

Gate Hinges—
 Western..... pair, \$1.40, 60¢
 N. E..... pair, \$7.00, 55¢
 N. K. Reversible..... pair, \$5.20, 55¢10¢5¢
 Clark's, Nos. 1, 2, 3..... 60¢10¢5¢
 N. Y. State..... pair, \$5.00, 55¢10¢
 Automatic..... pair, \$12.50, 50¢
 Common Sense..... pair, \$4.50, 50¢
 Seymour's..... 45¢10¢
 Shepard's..... 60¢10¢5¢
 Reed's Latch and Hinges..... pair, \$12.00, 50¢

Blind Hinges—
 Parker..... 75¢2¢
 Palmer..... 50¢5¢10¢
 Seymour..... 70¢2¢
 Nicholson..... 40¢10¢
 Huffer..... 50¢

Clark's, Nos. 1, 3, 5, 40 and 50..... 75¢10¢5¢80¢
 Clark's Mortise Gravity..... 50¢
 Sargent's, Nos. 1, 3, 5, 11, 13..... 75¢10¢75¢10¢5¢
 Sargent's Gravity..... 75¢10¢75¢10¢5¢
 Shepard's Noiseless..... 75¢10¢5¢
 Niagara..... 80¢2¢4¢
 Buffalo..... 80¢2¢
 Clark's Genuine Pat..... 80¢2¢
 O. S., Lull & Porter..... 75¢10¢
 Acme, Lull & Porter..... 75¢5¢
 Queen City Reversible..... 75¢
 Clark's Lull & Porter, Nos. 0, 1, 1 1/2, 2, 2 1/2, 3..... 75¢10¢2¢
 North's Automatic Blind Fixtures, No. 2, for Wood, \$10.50; No. 3, for Brick, \$13.50..... 25¢2¢

Hoes—
Handled—
 Garden, Mortar, &c..... 65¢
 Planter's, Cotton, &c..... 65¢
 Warren Hoe..... 60¢
 Magic..... pair, \$4.00

Eye—
 D. & H. Scovill..... 20¢
 Lane's Crescent Planter's Pattern..... 40¢5¢
 Lane's Razor Blade, Scovill Pattern..... 30¢
 Maynard, S. & O. Pat..... 45¢5¢
 Sandusky Tool Co., S. & O. Pat..... 60¢
 Hubbard & Co., S. & O. Pat..... 60¢
 Chattanooga Tool Co., S. & O. Pat..... 60¢
 Grub..... 60¢60¢10¢

Hog Rings and Rings—
 Hill's Improved Rings..... pair, \$4.50
 Hill's Old Style Rings..... pair, \$3.00
 Hill's Tongue..... pair, \$4.50
 Hill's Rings..... pair, \$2.25, \$2.40
 Perfect Rings..... pair, \$1.75, \$2.00
 Blair's Hog Rings..... pair, \$2.50, \$2.65
 Blair's Hog Rings..... pair, \$2.50, \$2.65
 Champion Rings..... pair, \$2.00
 Champion Rings, Double..... pair, \$2.25
 Brown's Rings..... pair, \$2.00
 Brown's Rings..... pair, \$1.25, \$1.50

Holding Apparatus—
 Moore's Hand Hoist, with Lock..... 60¢5¢
 Brake..... 20¢
 Moore's Differential Pulley Block..... 40¢
 Energy Mfg. Co.'s..... 20¢

Holders, File and Tool—
 Bais Pat..... pair, \$4.00, 25¢
 Nicholson File Holders..... 20¢

Hollow-Ware—
Iron—
 Stove Hollow-Ware..... 60¢60¢5¢
 Ground..... 60¢10¢60¢10¢10¢
 Enamelled Hollow-Ware..... 60¢10¢
 Maslin Kettles..... 65¢10¢
 Boilers and Saucepans..... 40¢5¢
 Tinned Boilers and Saucepans..... 40¢
 Gray Enamelled-Ware..... 50¢50¢5¢
 Stove..... 60¢10¢60¢10¢10¢
 Maslin Kettles..... 60¢10¢60¢10¢10¢
 Boilers and Saucepans..... 40¢5¢
 Agate and Granite Ware..... 25¢
 Rustless Hollow-Ware..... 50¢50¢5¢
 Galvanized Tea-Kettles..... 50¢50¢5¢

Knives—
 In. 6 7 8 9
 Each..... 55¢ 60¢ 65¢ 75¢

Silver Plated—
 4 mo. or 5 % cash in 30 days.
 Reed & Barton..... 40¢5¢
 Meriden Britannia Co..... 40¢5¢
 Simpson, Hall, Miller & Co..... 40¢5¢
 Rogers & Brother..... 40¢5¢
 Hartford Silver Plate Co..... 40¢5¢
 William Rogers Mfg. Co..... 40¢5¢5¢

Knives—
Cast Iron—
 Bird Cage, Sargent's list..... 60¢10¢10¢
 Bird Cage, Reading..... 60¢10¢10¢
 Clothes Line, Sargent's list..... 60¢10¢10¢
 Clothes Line, Reading list..... 60¢10¢60¢10¢10¢
 Ceiling, Sargent's list..... 55¢10¢10¢
 Harness Reading list..... 55¢10¢55¢10¢10¢
 Coat and Hat, Sargent's list..... 55¢10¢60¢10¢
 Coat and Hat, Reading..... 50¢10¢50¢10¢10¢
Wrought Iron—
 Cotton..... pair, \$1.25
 Cotton Pat. (N.Y. Mallet & Handle Wks.)..... 30¢
 Tassel and Picture (T. & S. Mfg. Co.)..... 50¢
 Wrought Staples, Hooks, &c..... 60¢10¢
 See Wrought Goods.

Wire—
 Wire Coat and Hat, Gem, list April, 1886..... 35¢
 Wire Coat and Hat, Miles, list April, 1886..... 45¢
 Indestructible Coat and Hat..... 45¢
 Wire Coat and Hat, Standard..... 45¢
 Belt..... 75¢10¢80¢

Miscellaneous—
 Grass, No. 2, \$2.00; No. 3, \$2.25; No. 4, \$2.50
 Nollin's Grass..... pair, \$2.25
 Bush..... 65¢60¢
 Whitmore Patent..... 55¢
 Hooks and Eyes—Malleable Iron..... 70¢70¢10¢
 Hooks and Eyes—Brass..... 60¢10¢10¢
 Fish Hooks, American..... 50¢
 Bench Hooks..... See Bench Stops.

Horse Nails—
 Nos. 6 7 8 9 10
 Ausable..... 25¢ 25¢ 25¢ 25¢ 25¢
 25¢10¢25¢10¢10¢
 Clinton, Fin..... 25¢ 25¢ 25¢ 25¢ 25¢
 Essex..... 25¢ 25¢ 25¢ 25¢ 25¢
 25¢10¢25¢10¢10¢
 Lyra..... 25¢ 25¢ 25¢ 25¢ 25¢
 40¢10¢5¢50¢
 Snowden..... 25¢ 25¢ 25¢ 25¢ 25¢
 40¢10¢5¢50¢
 Putnam..... 23¢21¢ 20¢ 19¢ 18¢
 10¢10¢ 10¢ 10¢ 10¢
 Vulcan..... 21¢ 21¢ 21¢ 19¢ 18¢, 12¢5¢
 Northwest..... 25¢ 25¢ 25¢ 25¢ 25¢
 10¢10¢5¢5¢
 Globe..... 23¢ 21¢ 20¢ 19¢ 18¢, 20¢2¢
 Boston..... 23¢ 21¢ 20¢ 19¢ 18¢, 20¢2¢
 A. C..... 25¢ 25¢ 25¢ 25¢ 25¢
 C. B.-K..... 25¢ 25¢ 25¢ 25¢ 25¢
 25¢10¢38¢5¢
 Champlain..... 25¢ 25¢ 25¢ 25¢ 25¢
 25¢10¢10¢

New Haven..... 25¢ 25¢ 25¢ 25¢ 25¢
 55¢10¢25¢10¢10¢
 Saranac..... 25¢ 21¢ 20¢ 19¢ 18¢, 30¢10¢
 Champion..... 25¢ 25¢ 25¢ 25¢ 25¢
 10¢10¢10¢
 Capewell..... 25¢ 25¢ 25¢ 25¢ 25¢
 35¢25¢35¢10¢
 Star..... 25¢ 21¢ 20¢ 19¢ 18¢
 10¢10¢10¢12¢4¢
 Anchor..... 25¢ 21¢ 20¢ 19¢ 18¢, 35¢
 Western..... 25¢ 21¢ 20¢ 19¢ 18¢, 40¢10¢
 Empire Bronzed..... 14¢ 14¢
Horse Shoes—See Shoes Horse.

Hose, Rubber—
 Competition..... 75¢10¢75¢10¢5¢
 Standard..... 70¢70¢10¢
 Extra..... 6¢60¢10¢
 N. Y. B. & P. Co., Para..... 30¢10¢
 N. Y. B. & P. Co., Extra..... 50¢
 N. Y. B. & P. Co., Dundee..... 60¢10¢5¢

Huskies—
 Blair's Adjustable..... pair, \$8.00
 Blair's Adjustable Clipper..... pair, \$7.00

Indurated Fiber-Ware.
 Spittons, No. 2, pair, \$6.75
 Basins, Ringed, pair, No. 1, \$3.70; No. 2, \$3.10; No. 3..... \$2.70
 Washtubs, Nested, Nos. 0, 1, 2 and 3 (4 pieces), pair, nests..... \$16.87
 Keelers, Nested, Nos. 1, 2, 3 and 4 (4 pieces), pair, nests..... \$6.37
 Butter Bowls, 16, 17 and 19-inch (3 pieces), pair, nests..... \$6.75
 Liquid Measures, pt., qt., 2 qt. and funnel (4 pieces), set..... \$3.00
 Dry Measures, 1, 2, 4, 8 and 16 lbs. (6 pieces), set..... \$2.25
 See also Putts.

Jack Screws—See Screws.

Kettles—
 Spun. Stamped.
 Brass, 7 to 17 in., pair, 24¢ 21¢
 Brass larger than 17 in., pair, 20¢ 23¢
 Enamelled and Tea Kettles..... See Hollow-Ware.

Keys—
 Lock Ass'n list Dec. 30, 1886..... 50¢10¢
 60¢5¢
 Eagle, Cabinet, &c..... 35¢25¢
 Hotchkiss' Brass Blanks..... 40¢
 Hotchkiss' Copper and Tinned..... 40¢
 Hotchkiss' Pad, and Cab..... 35¢
 Ratchet Bed Keys..... pair, \$4.00, 15¢
 Wollensak Tinned..... 50¢10¢

Knife Sharpeners—
 Parkin's..... Appledwood Handles, pair, \$6.00, 40¢
 Rosewood or Cocobolo, pair, \$9.00, 40¢

Knives—
 Wilson's Butcher Knives..... 25¢30¢
 Ames' Butcher Knives..... 25¢
 Foster Bros. Butcher, &c..... 40¢
 Nichols' Butcher Knives..... 40¢10¢
 Ames' Shoe Knives..... 20¢25¢
 Ames' Bread Knives, pair, \$1.50, 15¢20¢
 Moran's Shoe and Bread..... 20¢
 Hay and Straw..... See Hay Knives.
 Table and Pocket..... See Cutlery.
 Corn, Auburn Mfg. Co. Western Pat..... \$2.00
 Corn, Auburn Mfg. Co. Crescent..... \$3.50

Knobs—
 Door Mineral..... 65¢68¢
 Door Por. Jap'd..... 75¢78¢
 Door Por. Nickel..... \$2.00, \$2.25
 Door Por. Plated Nickel..... \$2.00, \$2.25
 Drawer, Porcelain..... 60¢10¢60¢10¢10¢
 Hemacite Door Knobs..... 40¢10¢50¢
 Yale & Towne Wood, list Dec., 1886..... 40¢
 Furniture Plain..... 75¢ gro inch, 10¢
 Furniture, Wood Screws..... 25¢10¢
 Base, Rubber Tip..... 70¢10¢5¢
 Picture, Judd's..... 60¢10¢10¢70¢
 Picture, Sargent's..... 70¢10¢
 Picture, Hemacite..... 35¢5¢
 Shutter, Porcelain..... 65¢10¢
 Carriage, Jap..... pair, \$8.00, 60¢10¢

Ladies—
 Melting, Sargent's..... 55¢10¢
 Melting, Reading..... 35¢10¢
 Melting, Monroe's Pat..... pair, \$4.00, 40¢
 Melting, P. S. & W..... 35¢10¢40¢
 Melting, Warner's..... 30¢

Lawn Mowers—
 Standard list..... 50¢10¢
 Quaker City..... 60¢10¢
 Enterprise..... 60¢10¢

Lanterns—
Tubular—
 Plain with Guards, pair, \$4.00, \$4.25
 Lift Wire, with Guards..... \$4.50, \$4.75
 Square Plain, with Guards..... \$4.00, \$4.25
 3, Lift Wire, with Guards..... \$4.50, \$4.75
 Without Guards, 25¢ pair, less.

Miscellaneous—
 Police, Small, \$6.00; Medium, \$7.25; Large, \$9.75..... 20¢25¢

Lemon Squeezers—
 Porcelain Lined, No. 1..... pair, \$6.00, 25¢30¢
 Wood, No. 2..... pair, \$3.00, 35¢
 Wood, Common..... pair, \$1.70, \$1.75
 Dunlap's Improved..... pair, \$3.75, 20¢
 Sammis..... No. 1, \$5.00; No. 2, \$9.12; \$18 pair..... 25¢10¢
 Jennings' Star..... pair, \$2.50
 The Boss..... pair, \$2.50
 Dean's, No. 1, pair, \$6.50; 2, \$8.30; 3, \$11.00
 Little Giant..... 50¢50¢5¢
 King..... 40¢5¢

Linen—
 Cotton and Linen Fish, Draper's..... 50¢
 Draper's Chalk..... 60¢
 Draper's Mason's Linen, 84 ft., No. 1, \$1.25; No. 2, \$1.75; No. 3, \$2.25; No. 4, \$2.75; No. 5, \$3.25..... 25¢
 Cotton Chalk..... 50¢
 Samson, Cotton, No. 4, \$2; No. 4 1/2, \$2.50; 10¢
 Silver Lake, Braided, No. 0, \$6.00; No. 1, \$6.50; No. 2, \$7.00; No. 3, \$7.50 pair, gross..... 25¢
 Mason's Linen, No. 3 1/2, \$1.50; No. 4, \$2.00; No. 4 1/2, \$2.50..... 25¢
 Mason's Colored Cotton..... 40¢
 Wire Clothes, No. 18, \$3.00; No. 19, \$3.00; No. 20, \$2.50

Ventilator Cord, Samson Braided, White or Drab Col., pair, \$7.50, 20¢

Locks, &c.—
 Door Locks, Latches, &c.
 List Dec. 30, '86, chgd Feb. 2, '87..... 50¢10¢60¢5¢
 Mallory, Wheeler & Co., list July, '88..... 50¢10¢10¢
 Sargent & Co., list Aug. 1, '88, 55¢2¢
 Reading Hardware Co., list Feb. 2, '88..... 55¢60¢10¢
 Livingston & Co..... 70¢
 Note.—Lower net prices often made.
 Perkins' Burglar Proof..... 60¢25¢
 Plate..... 35¢45¢
 F. Many's "Extension Cylinder" \$10.50 pair, gross..... 40¢40¢10¢
 Barnes Mfg. Co..... 40¢40¢10¢
 Yale Corrugated Key..... 35¢45¢
 Delta Flat Key..... 50¢
 L. & C. Round Key Latches..... 30¢10¢
 L. & C. Flat Key Latches..... 35¢45¢10¢
 Romer's Night Latches..... 15¢
 Yale, new list..... 35¢45¢
 Shephardson or V. S..... 40¢10¢
 Felter or American..... 40¢10¢
 Seed's N. Y. Haap Lock..... 25¢

Cabinets—
 Eagle, Gaylord Par, list March, '84, rev. Ker and Corbin..... Jan. 1, '85, 33¢45¢
 Delta, Nos. 36 to 39..... 40¢
 Delta, Nos. 51 to 63..... 40¢10¢
 Delta, Nos. 86 to 96..... 30¢
 Stoddard Lock Co..... 60¢25¢45¢
 "Champion" Night Latches..... 40¢
 Barnes Mfg. Co..... 40¢40¢10¢
 Eagle and Corbin Trunk..... 25¢2¢
 "Champion" Cab. and Combin..... 35¢45¢
 Yale..... 35¢ 4¢
 Romer's..... 25¢

Padlocks—
 List Dec. 23, '84..... 75¢75¢10¢
 Yale Lock Mfg. Co.'s..... 35¢45¢
 Eagle..... 25¢45¢
 Eureka, Eagle Lock Co..... 40¢25¢
 Romer's, Nos. 0 to 91..... 30¢
 Romer's Scandinavian, &c., Nos. 100 to 505..... 50¢, 15¢

A. E. Deitz..... 40¢
 Champion Padlocks..... 40¢
 Hotchkiss..... 30¢
 Horseshoe..... pair, \$9.40, 40¢10¢
 Barnes Mfg. Co..... 40¢40¢10¢
 Nock's..... 30¢
 Brown's Pat..... 25¢
 Scandinavian..... 60¢60¢10¢
 Fraim's Pat. Scandinavian low list..... 60¢
 Ames Sword Co. up to No. 150..... 40¢
 Ames Sword Co. above No. 150..... 50¢

Lumber Tools.
 Ring Peavies, "Blue Line"..... pair, \$20.00
 Ring Peavies, Common..... pair, \$18.00
 Steel Socket Peavies..... pair, \$21.00
 Mail Iron Socket Peavies..... pair, \$19.00
 Cant Hooks, "Blue Line"..... pair, \$16.00
 Cant Hooks, Common Finish..... pair, \$14.00
 Cant Hooks, Mail. Socket Clasp, "Blue Line" Finish..... \$16.00
 Cant Hooks, Mail. Socket Clasp, Common Finish..... pair, \$14.50
 Cant Hooks, Clip Clasp, "Blue Line" Finish..... pair, \$14.00
 Cant Hooks, Clip Clasp, Common Finish..... pair, \$12.00
 Hand Spikes..... pair, \$6 ft., \$15.00; 8 ft., \$20.00
 Pike Poles, Pike & Hook, pair, 12 ft., \$11.50; 14 ft., \$12.50; 16 ft., \$14.50; 18 ft., \$17.50; 20 ft., \$21.50
 Pike Poles, Pike only, pair, 12 ft., \$10.00; 14 ft., \$11.00; 16 ft., \$12.00; 18 ft., \$13.00; 20 ft., \$14.00
 Pike Poles, not ironed, pair, 12 ft., \$9.00; 14 ft., \$10.00; 16 ft., \$11.00; 18 ft., \$12.00; 20 ft., \$13.00
 Setting Poles, pair, 12 ft., \$14.00; 14 ft., \$15.00; 16 ft., \$17.00
 Swamp Hooks..... pair, \$18.00

Lustre—
 Four-ounce Bottles..... pair, \$1.75; gross..... \$17.00

Mallets—
 Hickory..... 20¢10¢20¢10¢10¢
 Lignumvitae..... 20¢10¢20¢10¢10¢
 B. & L. Block Co., Hickory & L. V..... 30¢30¢10¢

Match Safes—
 Dangerfield's Self-Igniting..... pair, \$1.50
 Mattocks, Regular list..... 60¢5¢60¢10¢

Meat Cutters—
 Dixon's pair, \$1.00, 40¢5¢
 Nos. 1 2 3 4
 \$14.00 \$17.00 \$19.00 \$30.00
 Woodruff's pair, \$1.00, 40¢5¢
 Nos. 1 2 3 4
 \$15.00 \$18.00 \$20.00 \$30.00
 Champion pair, \$1.00, 40¢5¢
 Nos. 1 2 3 4
 \$20.00 \$25.00 \$30.00 \$40.00
 Hales Pattern pair, \$1.00, 40¢5¢
 Nos. 1 2 3 4
 \$27.00 \$33.00 \$40.00 \$50.00
 American..... 30¢
 Nos. 1 2 3 4 B 5
 Each..... \$5 \$7 \$10 \$25 \$50 \$90
 Enterprise..... 30¢
 Nos. 1 2 3 4 B 5
 Each..... \$3 \$5 \$8 \$10 \$15 \$25
 Pennsylvania..... 40¢10¢
 Nos. 1 2 3 4
 pair, \$24.00 \$28.00 \$36.00 \$28.00
 Miles' Challenge pair, \$1.00, 40¢45¢10¢
 Nos. 1 2 3
 \$22.00 \$30.00 \$40.00
 Home No. 1..... pair, \$26.00, 55¢10¢
 Draw Cut, each:
 Nos. 5 2 6 8
 \$50 \$75 \$80 \$225..... 20¢25¢
 Beef Shavers (Enterprise)..... 20¢10¢30¢
 Chadbourn's Smoked Beef Cutter..... pair, \$6.00

Mining Knives—
 Am. (2d quality), pair, 1 blade, \$7; 2 blades, \$12; 3 blades, \$18..... net
 Lothrop's..... 20¢10¢
 Smith's, pair, \$2.00; Double, \$3.00..... 40¢45¢
 Knapp & Cowles..... 50¢10¢60¢
 Buffalo Adjustable..... pair, \$3.00, 25¢

Melasses Gates—

Stebbin's Pat.	70x70x7/16
Stebbin's Genuine	60x10x10
Stebbin's Tinned Ends	40x10
Chase's Hard Metal	50x10
Bush's	30x
Lincoln's Pattern	70x70x10
Weed's	30x10

Boss, # doz; No. 2, #3; No. 3, #3; No. 4, #10.
\$10. 60x10x10

Money Drawers... # doz, \$18x\$20

Muzzles—

Safety... # doz, \$3.00, 25 #

Nails, see Trade Report.

Wire Nails & Brads, list July 14, '87

Wire Nails, Standard Penny... # keg \$2.50x\$2.60

Nail Puller—

Curtis Hammer... # doz \$9, net

Giant, No. 1... # doz \$30.00, 10 #

Pelican... # doz, \$30.00, 25 #

Boss... # doz, \$30.00, 30 #

Lightning... # doz \$21.00

Nail Sets—

Square... # gr, \$4.00x\$4.25

Round... # gr, \$3.25

Cannon's Diamond Point... # gr, \$12, 30 #

Nut Crackers—

Table (H. & B. Mfg. Co.)... 40 #

Blake's Pattern... # doz \$2.00, 10 #

Turner & Seymour Mfg. Co... 50 #

Nuts—

Nuts, off list Jan. 1, 1888: Square, Hex.

Hot Pressed... 5.4 # 5.9 #

Cold Punched... 5.4 # 5.5 #

In lots less than 100 #, # doz, add 1/4; 1-# boxes, add 1/4 to list.

Oakum—

Government... # 7 1/2 # @ 8 #

U. S. Navy... # 6 1/2 # @ 7 #

Navy... # 5 1/2 # @ 6 1/2 #

Oilers—

Zinc and Tin... 65x65x10 #

Brass and Copper... 50x10x50x10 #

Malleable, Hammers, Improved, No. 1.

\$3.00; No. 2, \$4.00; No. 3, \$4.40 # doz.

10x10x10 #

Malleable, Hammers, Old Pattern, same.

list. 40 #

Prior's Pat. or "Paragon" Zinc.

60x10x10 #

Prior's Pat. or "Paragon" Brass.

50 #

Olmstead's Tin and Zinc.

80 #

Olmstead's Brass and Copper.

50 #

Broughton's Zinc.

60 #

Broughton's Brass.

60 #

Packing, Steam—

Rubber—

Standard... 60x10x60x10 #

Extra... 50x10x50x10 #

N. Y. B. & P. Co., Standard... 50x10x50 #

N. Y. B. & P. Co., Empire... 70 #

N. Y. B. & P. Co., Salamander... 70 #

Jenkins' Standard... # 65, 30 #

80, 35

Miscellaneous—

American Packing... 10x11 #

Russia Packing... 14 #

Italian Packing... 13 #

Cotton Packing... 15 #

Jute... 7 #

8

Padlocks—

See Locks.

Pails—**Galvanized Iron—**

Quarts... 10 12 14

Hill's Light Weight, # doz. 3.75 3.00 3.25

Hill's Heavy Weight, # doz. 3.00 3.25 3.75

Whiting's... 2.75 3.00 3.25

Sidney Shepard & Co... 2.50 3.00 3.40

Iron Clad... 2.75 3.00 3.25

Fire Buckets... 2.75 3.25 3.50

Buckets, see Well Buckets.

Indurated Fibre Ware—

Star Pails, 12 qt... # doz \$4.50

Fire, Stable and Milk, 14 qt... # doz \$5.35

Pencils—

Faber's Carpenters'... high list 50 #

Faber's Round Gilt... # gro \$5.25

Dixon's Lead... # gro \$4.50

Dixon's Lumber... # gro \$6.75

Dixon's Carpenters'... 40x10 #

Picks—

Railroad or Adze Eye, 5 to 6, \$12.00;

6 to 7, \$13.00... 60x5x60x10 #

Picture Nails—

Brass Head, Sargent's list... 50x10x10 #

Brass Head, Combination list... 50x10 #

Porcelain Head, Sargent's list... 50x10x10 #

Porcelain Head, Combination list... 40x10 #

Niles' Patent... 40 #

Pinking Irons— # doz 65 # net

Pipe, Wrought Iron—

List March 23, 1887.

1 1/2 and under, Plain... 50 #

1 1/2 and under, Galvanized... 50 #

1 1/2 and over, Plain... 55x2 1/2 #

1 1/2 and over, Galvanized... 55x2 1/2 #

Boiler Tubes, Iron... 60x2 1/2 #

Planes and Plane Irons—

Wood Planes—

Molding... 50x5x50x10 #

Bench, First Quality... 60x10x60x5 #

Bench, Second Quality... 60x10x60x10 #

Bailey's (Stanley R. & L. Co.)... 40x10 #

Iron Planes—

Bailey's (Stanley R. & L. Co.)... 40x10 #

Miscellaneous Planes (Stanley R. & L. Co.)... 20x10 #

Victor Planes (Stanley R. & L. Co.)... 20x10 #

Steele's Iron Planes... 30x35x5 #

Meriden Mail Iron Co.'s... 30x10x30x10 #

Davis's Iron Planes... 30x10x30x10 #

Birmingham Plane Co... 50x50x5 #

Gage Tool Co.'s Self-Setting... 20x10 #

Chaplin's Iron Planes... 40x40x5 #

Sargent's... 80x10x30x10 #

Plane Irons—

Plane Irons	20x10
Plane Irons, Butcher's	\$5.00x\$5.25 to 2
Plane Irons, Buck Bros	30 #
Plane Irons, Auburn Tool Co., "This- tle"	40 #
Sandusky Tool Co.	
Single and Cut	30 #
Double	40 #
L. & I. J. White	25 #

Pliers and Nippers—

Button's Patent	30x10x40 #
Hall's No. 2, 5 in., \$18.50; No. 4, 7 in.	\$21.00 # doz
Humason & Beckley Mfg. Co.	50x50x10 #
Gas Pliers	60 #
Gas Pliers, Custer's Nickel Plated	60x5 #
Eureka Pliers and Nippers	40 #
Russell's Parallel	25 #
P. S. & W. Cast Steel	50 #
P. S. & W. Tinner's Cutting Nippers	add 5 # dis 10 #
Carew's Pat. Wire Cutters	30 #
Morrill's Parallel	\$ doz, \$12.00... 30x5 #
Cronk's 8 in., \$15.00; 10 in. \$21.00.	40x40x5 #

Plumbs and Levels—

Regular List	70x10x70x10x10 #
Diston's	45x10 #
Pocket Levels	70x10x70x10x10 #
Davis Iron Levels	30 #
Davis' Inclometers	10x10 #

Pollish, Metal.

Prestoline... 20x10 #

Krestoline Paste... 30 #

Gaston's Silver Compound... 30x5 #

Pokes, Animal—

Bishop's I. X. L... # doz \$6.50

Bishop's O. K... # doz \$5.50

Bishop's Pioneer... # doz \$3.75

Bishop's American... # doz \$3.00

Poppers, Corn—

Round or Square, 1 qt... # gr \$12.00x\$15.00

Round or Square, 2 qt... # gr \$25.00x\$30.00

Post Hole and Tree Augers and Diggers—

Samson Post Hole Digger... # doz \$36.00.

Fletcher Post Hole Augers... # doz \$36, 30 #

Eureka Diggers... # doz \$16.00x\$17.00

Lead's... # doz \$8.00x\$9.00

Vaughan's Post Hole Auger... # doz \$5.00

Kohler's Little Giant... # doz \$18.00

Kohler's Hercules... # doz \$15.00

Kohler's New Champion... # doz \$9.00

Schmidt's... # doz \$18.00

Ryan's Post Hole Diggers... # doz \$24.00

Cronk's Post Hole Bars... # doz \$60.00

Gibb's Post Hole Digger... # doz \$30.00.

40x40x10 #

Potato Parers—

White Mountain... # doz \$5.00x\$5.50

Antrim Combination... # doz \$8.00

Hoosier... # doz \$13.50

Pruning Hooks and Shears—

Diston's Combined Pruning Hook and

Shear... # doz \$18.00, 20x10 #

Diston's Pruning Hook... # doz \$12.00

E. S. Lee & Co.'s Pruning Tools... 40 #

Pruning Shears, Henry's Pat... # doz

\$3.75x\$4.00 net

Henry's Pruning Shears... # doz \$4.25

Wheeler, M. & C. Co.'s Combination... 4.50 net

Dunlap's Saw and Chisel... # doz \$8.50, 30 #

J. Mallinson & Co., No. 1, \$5.25; No. 2, 7.25

Pulleys—

Hot House, Awning, &c... 60x10 #

Japanned Screw... 60x10 #

Brass Screw... 60x10 #

Japanned Slide... 60x10 #

Japanned Clothes Line... 60x10 #

Empire Sash Pulley... 55x60 #

Moore's Sash, Anti-Friction... 50 #

Hay Fork, Solid Eye, 1.00; Swivel

\$1.50... 60x10x50x10x5 #

Hay Fork, "Anti-Friction," 5 in. Solid.

\$5.70... # doz

Hay Fork, "F" Common and Pat.

Bushed... 20 #

Hay Fork, Tarbox Pat. Iron... 20 #

Hay Fork, Reed's Self-Lubricating... 40 #

Shade Rack... 45 #

Tackle Hooks... See Blocks

Moore's Anti-Friction 5 in. Wheel... 40 #

Pumps—

Cistern, Best Makers... 50x10x60 #

Pitcher Spout, Best Makers... 60x10x60 #

Pitcher Spout, Cheaper Goods... 210x10 #

70x8x5 #

Punches—

Saddlers' or Drive, good, # doz... 60x65 #

Bemis & Call Co.'s Cast Steel Drive... 50x5 #

Bemis & Call Co.'s Springfield Socket... 50x5 #

Spring, good quality... # doz \$2.50x\$2.60

Spring, Leach's Pat... 15 #

Bemis & Call Co.'s Spring and Check... 40 #

Solid Tinner's... # doz \$1.44, 55 #

Tinner's Hollow Punches... 20x2 #

Rice Hand Punches... 15 #

Avery's Revolving... 30x10 #

Avery's Saw-Set and Punch. See Saw Sets.

Rail—

Sliding Door, Wrt Brass, # 35 # 15 #

Sliding Door, Bronzed Wrt Iron, # ft. 7 #

Sliding Door, Iron, Painted, # foot 4 #, 40 #

Barn Door, Light, 14 #

Per 100 feet... \$2.00 2.50 3.10, 10 #

B. D. for N. E. Hangers—

Small. Med. Large.

Per 100 feet... \$2.15 2.70 3.25, net

Terry's Wrought Iron, # foot... 4 #x\$5 #

Victor Track Rail, 7 # # foot... 50x2 #

Carrier Steel Rail, # foot... 4 #x\$

Moore's Wrought Iron... 25 #

Rakes—

Cast Steel, Association goods... 65 #

Cast Steel, outside goods... 60x10x70 #

Malleable... 70x70x5 #

Gibbs Lawn Rake... \$12.00, 50 #

Canton Lawn Rake... \$9.00, 50 #

Ft. Madison Prize Bow Brace and Feet

less... 65 #

Fort Madison Steel Tooth Lawn Rake

Machines—	
Flat Head, Iron.....	55¢
Round Head, Iron.....	55¢
Beach and Hand—	
Bench, Iron.....	55¢
Bench, Wood, Beech.....	75¢
Bench, Wood, Hickory.....	90¢
Hand, Wood.....	25¢
Lag, Stout Point.....	75¢
Coach and Lag, Gimlet Point.....	75¢
Bed.....	25¢
Hand Rail, Sargent's.....	65¢
Hand Rail, H. & B. Mfg. Co.....	70¢
Hand Rail, Am. Screw Co.....	75¢
Jack Screws, Millers Falls list.....	60¢
Jack Screws, P. S. & W.....	35¢
Jack Screws, Sargent.....	60¢
Jack Screws, Stearns.....	60¢
Scroll Saws—	
Lester, complete, \$10.00.....	25¢
Rogers, complete, \$4.00.....	25¢
Barnes' Builders' and Cabinet Makers'.....	35¢
Barnes' Scroll Saw Blades.....	35¢
Scythe Snaths.....	50¢
Shears—	
American (Cast) Iron.....	75¢
Pruning..... See Pruning Hooks and Shears.	
Barnard's Lamp Trimmers.....	75¢
Timmers.....	20¢
Seymour's, List, Dec. 1881.....	60¢
Heinrich's, List, Dec. 1881.....	60¢
Heinrich's Tailor's Shears.....	35¢
First quality C. S. Trimmers.....	80¢
Second quality C. S. Trimmers.....	80¢
Acme Cast Shears.....	100¢
Diamond Cast Shears.....	100¢
Clippers.....	100¢
Victor Cast Shears.....	75¢
Howe Bros. & Hulbert, Solid Forged Steel.....	40¢
Chicago Drop Forge & F. Co., Solid Steel Reg'd.....	60¢
Class Shear Co., Japaned.....	60¢
Class Shear Co., Nickel, same list.....	60¢
Shovels—	
Shovel Door—	
M. W. Co., List July, 1888.....	50¢
R. & E. List Dec. 18, 1885.....	55¢
Corbin's list.....	60¢
Patent Roller.....	60¢
Patent Roller, Hatfield's.....	75¢
Russell's Anti-Friction, List Dec. 1885.....	60¢
Moore's Anti-Friction.....	50¢
Shutter—	
R. & E. List Dec. 18, 1885.....	60¢
Sargent's list.....	60¢
Reading list.....	60¢
Ship Tools—	
L. & I. J. White.....	90¢
Albion Mfg. Co.....	25¢
Sheets, Horse, Mule, &c.—	
Horse—	
Burden's, Perkins', Phoenix, at factory.....	\$4.00
Mule—	
Add \$1 per keg to above prices.	
Co. Wrought—	
Ton lots.....	9¢
1000 lb lots.....	9¢
500 lb lots.....	10¢
Shot—	
(Eastern prices 2¢ off, cash, 5 days.)	
Drop, 7 bag, 25 lb.....	12.20
Drop, 7 bag, 5 lb.....	20
Drop, 7 bag, 1 lb.....	1.45
Drop, 7 bag, 1 lb.....	34
Shovels and Spades—	
Ames' Shovels, Spades, &c., List Nov. 1, 1888.....	30¢
Notes.—Jobbers frequently give 5¢ 75¢ extra on above.	
Griffith's Black Iron.....	50¢
Griffith's C. S. R. R. Goods.....	20¢
Old Colony (Sanford Fork & Tool Co.) 20¢	
St. Louis Shovel Co.....	20¢
Hussey, Blinn & Co.....	15¢
Hubbard & Co.....	20¢
Leigh Mfg. Co.....	50¢
Payne Pettibone & Son, list January, 1888.....	30¢
Remington's (Lowman's Patent).....	80¢
Bowland's, Black Iron.....	60¢
Bowland's Steel.....	60¢
Shovels and Tongs—	
Iron Head.....	60¢
Brass Head.....	60¢
Skins, Thimble—	
Western list.....	75¢
Columbus Vrt. Steel, list Nov. 1, 1887.....	20¢
Coldbrookdale Iron Co.....	60¢
Utica P. S. T. Skins.....	60¢
Utica Turned and Fitted.....	35¢
Sieves—	
Buffalo Metallic, S. S. & Co.....	50¢
Barlow Flour Sieves.....	75¢
Electric.....	75¢
Hunter's.....	75¢
Smith's Adjustable Sieves.....	75¢
Smith's Adjustable Milk Strainer.....	75¢
Smith's Adjustable T. & C. Strainer.....	75¢
Stoves, Wooden Rim—	
Mesh 15, Nested, 70¢.....	90¢
Mesh 20, Nested, 85¢.....	11.00
Mesh 24, Nested, 1.00.....	1.10
Stoves—	
School, by case.....	50¢
Snaps, Harness, &c.—	
Anchor (T. & S. Mfg. Co.).....	65¢
Fitch's (Bristol).....	50¢
Hotchkiss.....	50¢
Andrews.....	50¢
Sargent's Patent Guarded.....	70¢
German, new list.....	40¢
Covert.....	50¢
Covert, New Patent.....	50¢
Covert, New E. E.....	50¢
Covert Spring.....	50¢

Soldering Irons—	
Covert's Adjustable, list Jan. 1, 1888.....	35¢
Spoke Shaves—	
Iron.....	45¢
Wood.....	30¢
Bailey's (Stanley R. & L. Co.).....	40¢
Stearns.....	20¢
Spoke Trimmers—	
Bonney's.....	75¢
Stearns.....	20¢
Iver, No. 1, \$15.00; No. 2, \$12.00.....	75¢
Douglas.....	75¢
Spoons and Forks—	
Tinned Iron—	
Basting, Cen. Stamp. Co.'s list.....	70¢
Solid Table and Tea, Cen. Stamp. Co.'s list.....	70¢
Buffalo S. S. & Co.....	35¢
Silver-Plated—	
(4 mos. or 5¢ cash 80 days)	
Maiden Brit. Co., Rogers.....	50¢
C. Rogers & Bros.....	50¢
Rogers & Bro.....	50¢
Reed & Barton.....	50¢
Wm. Rogers Mfg. Co.....	50¢
Simpson, Hall, Miller & Co.....	50¢
Holmes & Edwards Silver Co.....	50¢
H. & E. Silver Co., Mexican Silver.....	50¢
H. & E. Silver Co., Durham Silver.....	50¢
German Silver.....	50¢
German Silver, Hall & Elton.....	50¢
Nickel Silver.....	50¢
Boardman's Flat Ware.....	50¢
Boardman's Nickel Silver.....	50¢
Boardman's Britannia Spoons, case.....	50¢
Springs—	
Elliptic, Concord, Platform and Half Scroll.....	60¢
Cliff's Bolster Springs.....	25¢
Squares—	
Steel and Iron.....	75¢
Nickel-Plated.....	75¢
Try Square and T Bevels.....	70¢
Disston's Try Square and T Bevels.....	70¢
Winterbottom's Try and Miter.....	30¢
Starrett's Micrometer Caliper Squares.....	25¢
Avery's Flush Bevel Squares.....	30¢
Staples—	
Rence Staples, Galvanized.....	Same price
Fence Staples, Plain.....	See Trd. Rep.
Steelyards—	
40¢	
Stocks and Dies—	
Blacksmith's.....	30¢
Butterfield's Goods.....	30¢
Lightning Screw Plate.....	25¢
Reese's New Screw Plates.....	35¢
Stone—	
Hindostan No. 1, 3¢; Axe, 3¢; Slips No. 1, 4¢.....	
Sand Stone.....	2¢
Washita Stone, Extra.....	10¢
Washita Stone, No. 1.....	10¢
Washita Stone, No. 2.....	10¢
Washita Stone, No. 1, Extra.....	10¢
Washita Stone, No. 2, Extra.....	10¢
Arkansas Stone, No. 1, 4 to 6 in.....	15¢
Arkansas Stone, No. 1, 6 to 9 in.....	15¢
Turkey Oil Stone, 4 to 8 in.....	40¢
Lake Superior Chisel.....	15¢
Lake Superior Slips.....	15¢
Seneca Stone, Red Paper Brand.....	15¢
Seneca Stone, High Rounds.....	20¢
Seneca Stone, Small Wheels.....	20¢
Stone Polish—	
Joseph Dixon's.....	50¢
Gem.....	50¢
Gold Medal.....	50¢
Mirror.....	50¢
Lustro.....	50¢
Ruby.....	50¢
Rising Sun.....	50¢
Dixon's Plumbago.....	50¢
Boynston's Noon Day.....	50¢
Parlor Pride Stove Polish.....	50¢
Yates Liquid.....	50¢
Yates Standard Paste Polish.....	50¢
Jet Black.....	50¢
Japanese.....	50¢
Firestone.....	50¢
Diamond O. K. Enamel.....	50¢
Bonnett's Liquid Stove Polish.....	50¢
Bonnett's Paste Stove Polish.....	50¢
Black Eagle Benzine Paste.....	50¢
Black Jack Water.....	50¢
Nickel Plate Paste.....	50¢
Tacks, Brads, &c.—	
List Jan. 2, 1888. (Note.—Some manufacturers are selling Tacks at slightly higher prices than those named):	
American Iron Carpet.....	80¢
Steel Carpet.....	80¢
Swedes Iron Carpet.....	80¢
American Iron Cut.....	75¢
Swedes Iron.....	75¢
Swedes Iron, Upholsterers.....	75¢
Tinned Swedes Iron.....	75¢
Tinned Swedes Iron, Upholsterers.....	75¢
Gimp and Lace.....	75¢
Tinned Gimp and Lace.....	75¢
Swedes Iron Trimmers.....	75¢
Swedes Iron Miners.....	75¢
Swedes Iron Bill Posters.....	75¢
Swedes Steel (Swedes Iron price list).....	80¢
Copper Tacks.....	50¢
Copper Finishing, Trunk and Clout Nails.....	50¢
Finishing Nails.....	70¢
Trunk and Clout Nails.....	70¢
Tinned Trunk and Clout Nails.....	70¢
Basket Nails.....	70¢

Common and Patent Brads, 70¢ to 10¢	
Hungarian Nails.....	70¢
Chair Nails.....	70¢
Zinc Glass Points.....	50¢
Cigar Box Nails.....	50¢
Picture-Frame Points.....	50¢
Looking-Glass Tacks.....	50¢
Leathered Carpet.....	50¢
Brush Tacks.....	50¢
Shoe Finders, List Jan. 2, 1888.....	10¢
Lining and Saddle Nails, List Jan. 1, 1888.....	10¢
Silvered.....	30¢
Japanned.....	20¢
Double-Pointed Tacks.....	50¢
Wire Carpet Nails.....	50¢
Wire Brads and Nails, see Nails, Wire.....	50¢
Steel-Wire Brads, R. & E. Mfg. Co.'s list.....	50¢
Tap Borers—	
Common and Rind.....	30¢
Ive's Tap Borers.....	35¢
Enterprise Mfg. Co.....	30¢
Clark's.....	35¢
Tapes, Measuring—	
American.....	25¢
Spring.....	40¢
Chesterman's, Regular list.....	25¢
Thermometers—	
Tin Case.....	80¢
Thimble Skins—See Skins.	
Ties, Bale-Steel	
Standard Wire, list.....	50¢
Timbers' Shears, &c.—	
Shears and Snips (P. S. & W.).....	20¢
Punches, see Punches.....	
Snips, J. Mallinson & Co.....	35¢
Tinware—	
Stamped, Japaned and Plated, list Jan. 20, 1887.....	75¢
Tire Benders, Upsetters, &c.—	
Stoddard's Lightning Tire Upsetters.....	15¢
Detroit Perfected Tire Bender.....	15¢
Tobacco Cutters—	
Champion.....	20¢
Wood Bottom.....	20¢
All Iron.....	20¢
Nashua Look Co.'s.....	18¢
Wilson's.....	55¢
Sargent's.....	55¢
Acme.....	55¢
Transom Lifters—	
Wollensak's.....	50¢
Class 3 and 4, Bronze Iron.....	25¢
Class 3 and 4, Brass.....	25¢
Skylight Lifters.....	25¢
Crown, Eagle and Shield.....	50¢
Reith's, list Jan. 1, 1887.....	50¢
Bronzed Iron Rods.....	50¢
Brass, Real Bronze or Nickel Plate.....	30¢
Excelsior.....	50¢
Payson's Universal.....	40¢
Traps—	
Game.....	35¢
Newhouse Pattern.....	70¢
Game, Blake's Patent.....	40¢
Mouse and Rat—	
Mouse Wood, Choker.....	11¢
Mouse, Round Wire.....	10¢
Mouse, Cage Wire.....	10¢
Mouse, Catch, ten alive.....	10¢
Mouse, "Bonanza".....	10¢
Mouse Delusion.....	10¢
Rat, "Decoy".....	10¢
Ideal.....	10¢
Cyclone.....	10¢
Hotchkiss Metallic Mouse, 5-hole traps.....	10¢
In full cases.....	10¢
Trowels—	
Lothrop's Brick and Plastering.....	25¢
Reed's Brick and Plastering.....	15¢
Easton's Brick and Plastering.....	25¢
Peace's Plastering.....	25¢
Clement & Maynard's.....	25¢
Rose's Brick.....	15¢
Brade's Brick.....	25¢
Worrall's Brick and Plastering.....	20¢
Garden.....	70¢
Triers—	
Butter and cheese.....	25¢
Trucks, Warehouse, &c.—	
B. & L. Block Co.'s list.....	40¢
Tubes, Boiler—	
See Pipe.....	
Twine—	
Flax Twine.....	BC. B.
No. 9, 1/4 and 1/2 B Balls.....	25¢
No. 12, 1/4 and 1/2 B Balls.....	25¢
No. 18, 1/4 and 1/2 B Balls.....	25¢
No. 24, 1/4 and 1/2 B Balls.....	25¢
No. 30, 1/4 and 1/2 B Balls.....	25¢
No. 36, 1/4 and 1/2 B Balls.....	25¢
No. 42, 1/4 and 1/2 B Balls.....	25¢
Chalk Line, Cotton, 1/4 B Balls.....	25¢
Mason Line, Linen, 1/4 B Balls.....	55¢
2-Ply Hemp, 1/4 and 1/2 B Balls (Spring Twine).....	11¢
3-Ply Hemp, 1/4 B Balls.....	12¢
3-Ply Hemp, 1/2 B Balls.....	11¢
Cotton Wrapping, 5 Balls to a.....	15¢
2, 3, 4 and 5-Ply Jute, 1/2 B Balls.....	10¢
Wool.....	6¢
Cotton Mops, 6, 9, 12 and 15 lb to doz.....	15¢
Vices—	
Solid Box.....	60¢
Parallel.....	60¢
Fisher & Norris Double Screw.....	15¢
Stephens.....	30¢

Wicker's.....	30¢
Wilson's.....	55¢
Howard's.....	40¢
Bonney's.....	40¢
Miller's Falls.....	40¢
Trouton.....	40¢
Merrill's.....	15¢
Sargent's.....	60¢
Backus and Union.....	40¢
Double Screw Leg.....	15¢
Prentiss.....	20¢
Simpson's Adjustable.....	30¢
Moore's.....	30¢
Saw Filers—	
Bonney's, Nos. 2 & 3.....	40¢
Stearns.....	35¢
Stearns' Silent Saw Vices.....	35¢
Sargent's.....	35¢
Hopkins.....	40¢
Reading.....	40¢
Wentworth.....	40¢
Combination Hand Vices.....	75¢
Correll Hand Vices.....	35¢
Bauer's Pipe Vices.....	10¢

Wagon Boxes—	
Per D.....	35¢
Wagon Jacks—	
Daisy.....	75¢
Washer Cutters—	
Smith's Pat.....	75¢
Johnson's.....	75¢
Penny's.....	75¢
Appleton's.....	75¢
Bonney's.....	75¢
Washers—	
Size.....	5-16 3/4 1/2 3/4 1 1 1/2
Washers.....	7 5/8 1 1/2 3/4 3/4 3/4 3/4
In lots less than 200 lb, 75¢, add 1/4¢ 5-b boxes 1¢ to list.	
Wedges—	
Iron.....	75¢
Steel.....	75¢
Well Buckets, Galvanized—	
Hill's.....	75¢
Iron Clad.....	75¢
Whiting's Flat Iron Band.....	75¢
Whiting's Wired Top.....	75¢
Well Wheels—	
8 in., \$2.25; 10 in., \$2.70; 12 in., \$3.25	
Wire—	
Iron—	
Market.....	
Br. & Ann., Nos. 0 to 18.....	70¢
Cop'd, Nos. 0 to 18.....	70¢
Galv., Nos. 0 to 18.....	65¢
Tin'd, Tinned list Nos. 0 to 18.....	67¢
Stone.....	
Br. & Ann'd, Nos. 16 to 18.....	75¢
Bright and Ann'd, Nos. 19 to 24.....	75¢
Br. & Ann'd, Nos. 27 to 36.....	75¢
Tinned.....	75¢
Tinned, Broom Wire.....	70¢
Galvanized Fence.....	65¢
Annealed Fence, Nos. 8 and 9.....	75¢
Annealed Grape, Nos. 10 to 14.....	75¢
Brass, list Jan. 18, 1884.....	15¢
Copper, list Jan. 18, 1884.....	35¢
Barb Fence.....	See Trade Report
Wire on Spools.....	65¢
Malin's Steel and Tin'd Wire on Spools.....	40¢
Malin's Brass and Cop. Wire on Spools.....	50¢
Cast Steel Wire.....	50¢
Subs Steel Wire.....	50¢
Steel Music Wire, Nos. 12 to 20.....	55¢
Picture Wire.....	New list, 50¢
Barb Wire Safety Guards.....	1000, \$9.00, 25¢
Wire Clothes Lines, see Lines.....	
Wire Cloth, Netting, &c.—	
Painted Screen Cloth, good quality.....	100 sq. ft., \$1.00
Galvanized Wire Netting.....	75¢
Wire Goods—	
See Bright Wire Goods.....	
Wire Rope—	
List May 1, 1886.....	30¢
Iron.....	40¢
Cast Steel.....	40¢
Wrenches—	
American Adjustable.....	40¢
Baxter's Adjustable "S".....	40¢
Baxter's Diagonal.....	40¢
Coe's Genuine.....	55¢
Coe's "Mechanics".....	55¢
Girard Standard.....	70¢
Machinists' Sterling Wrench Co.....	70¢
Lamson & Sessions' Engineers'.....	60¢
Lamson & Sessions' Standard.....	70¢
Goes' Pattern, Wrought.....	80¢
Girard Agricultural.....	80¢
Lamson & Sessions' Agric'l.....	80¢
Sterling Wrought.....	80¢
Bemis & Call's.....	35¢
Pat. Combination.....	35¢
Merrick's Pattern.....	35¢
Briggs' Pattern.....	25¢
Cylinder or Gas Pipe.....	40¢
No. 3 Pipe.....	40¢
Alken's Pocket (Bright).....	\$6.00, \$1.00
The Favorite Pocket.....	75¢
Webster's Pat. Combination.....	40¢
Boardman's.....	20¢
Always Ready.....	25¢
Milligan.....	50¢
Donohue's Engineer.....	20¢
Acme, Bright.....	60¢
Acme, Nickel.....	60¢
Walker's.....	55¢
Diamond Steel.....	55¢

Wringers, Clothes—	
List Jan., 1889, \$3.00 off.....	
Wrought Goods—	
Staples, Hooks, &c., list Jan. 12, 1886.....	

CURRENT METAL PRICES.

MARCH 13, 1889.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market reports.

IRON AND STEEL.	
Bar Iron from Store.	
Common Iron:	
3/4 to 2 in. round and square.	1/2 lb 1.90 @ ...
1 to 6 in. x 3/4 to 1 in.	1/2 lb 2.00 @ 2.10
Refined Iron:	
3/4 to 2 in. round and square.	1/2 lb 2.00 @ 2.10
1 to 6 in. x 3/4 to 1 in.	1/2 lb 2.00 @ 2.10
1 to 6 in. x 3/4 and 5-16.	1/2 lb 2.30 @ 2.30
Rods—3/4 and 1-1/2 round and sq.	1/2 lb 2.10 @ 2.20
Boards—1 to 6 x 8-16 to No. 12.	1/2 lb 2.30 @ 2.30
"Burden Best" Iron, base price.	1/2 lb 3.00 @ ...
Burden's "H. B. & S." Iron, base price.	1/2 lb 3.80 @ ...
"Uster"	1/2 lb 3.10 @ ...
Norway Rods	4.00 @ 5.00

Merchant Steel from Store.	
Open-Hearth and Bessemer Machinery.	
Toe Calk, Tire and Sleigh Shoe, base price in small lots.	2 1/2
Best Cast Steel, base price in small lots.	5 1/2
Best Cast Steel Machinery, base price in small lots.	5 1/2

Sheet Iron from Store.	
Common American.	
R. G. Cleaned.	
10 to 16.	1/2 lb 2.75 @ 2.80
17 to 20.	1/2 lb 2.85 @ 2.90
21 to 24.	1/2 lb 3.00 @ 3.10
25 and 26.	1/2 lb 3.20 @ 3.30
27.	1/2 lb 3.35 @ 3.45
28.	1/2 lb 3.50 @ 3.60

Galv'd.	
14 to 20.	1/2 lb 4.50 @ 4.60
21 to 24.	1/2 lb 4.75 @ 4.85
25 to 26.	1/2 lb 5.25 @ 5.35
27.	1/2 lb 5.50 @ 5.60
28.	1/2 lb 5.80 @ 5.90
Patent Flashed.	1/2 lb 10 1/2 @ 10 3/4
Russia.	1/2 lb 10 1/2 @ 10 3/4
American Cold Rolled B. B.	1/2 lb 5 1/2 @ 5 3/4

English Steel from Store.	
Best Cast.	1/2 lb 15 @
Extra Cast.	1/2 lb 16 1/2 @
Swaged, Cast.	1/2 lb 16 @
Best Double Shear.	1/2 lb 15 @
Winter, 1st quality.	1/2 lb 12 1/2 @
German Steel, Best.	1/2 lb 10 @
2d quality.	1/2 lb 9 @
3d quality.	1/2 lb 8 @
Sheet Cast Steel, 1st quality.	1/2 lb 15 @
2d quality.	1/2 lb 14 @
3d quality.	1/2 lb 13 1/2 @

METALS.	
Tin.	
Banca, Pigs.	23 1/2 @
Strait, Pigs.	23 @
English, Pigs.	23 1/2 @
Strait in Bars.	24 @

Tin Plates.	
Charcoal Plates—Bright.	
Per box.	
Melva Grade.	
IC, 10 x 14.	28.75 @ 29.00
IC, 12 x 12.	6.00 @ 6.25
IC, 14 x 30.	5.75 @ 6.00
IC, 20 x 26.	12.00 @ 12.50
IX, 10 x 14.	7.25 @ 7.50
IX, 12 x 12.	7.50 @ 7.75
IX, 14 x 30.	7.25 @ 7.50
IX, 20 x 26.	15.00 @ 15.50
DC, 12 1/2 x 17.	5.50 @ 5.75
DX, 12 1/2 x 17.	7.00 @ 7.25

Oil and Grade.	
IC, 10 x 14.	5.75 @ 6.00
IC, 12 x 12.	6.00 @ 6.25
IC, 14 x 30.	5.75 @ 6.00
IC, 20 x 26.	12.00 @ 12.50
IX, 10 x 14.	7.25 @ 7.50
IX, 12 x 12.	7.50 @ 7.75
IX, 14 x 30.	7.25 @ 7.50
IX, 20 x 26.	15.00 @ 15.50
DC, 12 1/2 x 17.	5.50 @ 5.75
DX, 12 1/2 x 17.	7.00 @ 7.25

Coke Plates—Bright.	
Steel Coke.—IC, 10 x 14, 14 x 30.	\$4.75 @ \$5.00
10 x 30.	7.25 @ 7.50
20 x 26.	9.75 @ 10.25
IX, 10 x 14, 14 x 30.	5.50 @ 5.75
BV Grade.—IC, 10 x 14, 14 x 30.	4.40 @ 4.60

Charcoal Plates—Terns.	
Dean Grade.—IC, 14 x 30.	\$4.40 @ \$4.60
30 x 26.	9.00 @ 9.25
IX, 14 x 30.	4.40 @ 4.60
30 x 26.	11.00 @ 11.25
Abocorne Grade.—IC, 14 x 30.	4.25 @ 4.50
30 x 26.	8.00 @ 8.25
IX, 14 x 30.	5.25 @ 5.50
30 x 26.	10.50 @ 10.80

Tin Boiler Plates.	
IX, 14 x 36.	112 sheets @ \$12.50 @ \$12.75
IX, 14 x 36.	112 sheets @ 12.75 @
IX, 14 x 41.	112 sheets @ 14.25 @

Copper.	
Duty: Pig. Bar and Ingot, 44: Old Copper, 34 1/2 lb.	
Manufactured (including all articles of which Copper is a component of chief value, 45 1/2 ad valorem.	
Ingot.	
Lake.	16 1/2 @ 17 @
"Anchor" Brand.	16 @ 16 @

Sheet and Bolt.
Prices adopted by the Association of Copper Manufacturers of the United States, December 10, 1887, being quotations for all sized lots.

Weights per square foot and prices per pound.	
Not wider than	Not longer than
Over 4 in.	Over 4 in.
30—72	35 25 35 35 37 38 31 33
30—72	35 25 35 35 37 38 31 33
36—96	35 25 35 35 37 38 31 33
48—96	35 25 35 35 37 38 31 33
48—96	35 25 35 35 37 38 31 33
60—96	35 25 35 35 37 38 31 33
60—96	35 25 35 35 37 38 31 33
84—96	35 25 35 35 37 38 31 33
84—96	35 25 35 35 37 38 31 33
Over 84 in. wide	35 25 35 35 37 38 31 33

All Bath Tub Sheets. 16 oz. 14 oz. 12 oz. 10 oz.
Per pound. \$0.33 0.30 0.28 0.25
Bolt Copper, 3/4 inch diameter and over, per pound. 30¢
Circles, 60 inches in diameter and less, 3 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Circles over 60 inches diameter, up to 96 inches diameter inclusive, 5 cents per pound advance over lowest prices of Sheet Copper of the same thickness.
Circles over 96 inches diameter, 6 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Segment and Pattern Sheets, 3 cents per pound advance over price of sheets required to cut them from.
Cold or Hard Rolled Copper, 14 ounces per square foot and heavier, 1 cent per pound over the foregoing prices.
Cold or Hard Rolled Copper, lighter than 14 ounces per square foot, 2 cents per pound over the foregoing prices.

Copper Bottoms, Pits and Flats.
14 ounces to square foot and heavier. Per pound. 28¢
18 ounces and up to 14 ounces to square foot. 29¢
10 ounces and up to 18 ounces. 31¢
Circles less than 8 inches diameter 2 cents per pound additional.
Circles over 18 inches diameter are not classed as Copper Bottoms.

Tinning.
Tinning sheets on one side, 10, 12 and 14 x 48 each. 8¢
Tinning sheets on one side, 30 x 60 each. 30¢
For tinning boiler sizes, 9 in. (sheets 14 in. x 60 in.), each. 15¢
For tinning boiler sizes, 8 in. (sheets 14 in. x 56 in.), each. 10¢
For tinning boiler sizes, 7 in. (sheets 14 in. x 56 in.), each. 10¢
Tinning sheets on one side, other sizes, per square foot. 3¢
For tinning both sides double the above prices.

Planished Copper List May 5, 1888. Net
Seamless Copper. Seamless Brass.
3/4 inch 1/2 lb. 50¢ 1/2 inch 1/2 lb. 47¢
1/2 " " 44¢ 1/2 " " 41¢
3/8 " " 42¢ 3/8 " " 39¢
1/4 " " 40¢ 1/4 " " 37¢
1/8 " " 38¢ 1/8 " " 35¢
1/16 " " 34¢ 1/16 " " 31¢

Roll and Sheet Brass.
Discount from list. 10 @ 15 %
High Brass Rods.
Over 1 inch diameter. 37¢
3/4 inch to 1 inch diameter, both inclusive. 34¢
No. 8 and less than 3/4 inch diameter. 36¢
Smaller than No. 8. 30¢
Hexagon, Octagon and Square, 2¢ 1/2 lb advance over Round Rods.

Spelter.
Duty: Pig. Bars and Plates, \$1.50 100 lb.
Western Spelter. 54¢ @ 55¢
"Bergenport". 54¢ @ 55¢
"Bertha". 74¢ @ 8¢

Zinc.
Duty: Sheet, 2 1/2¢ 100 lb.
600 lb casks. 61¢
Per lb. 71¢

Lead.
Duty: Pig. 3¢ 100 lb. Old Lead, 2¢ 1/2 lb. Pipe and Sheets, 3¢ 1/2 lb.
American Newark. 44¢
Pipe, subject to trade discount. 3¢
Tin-Lined Pipe, subject to trade discount. 15¢
Black Tin Pipes, subject to trade discount. 45¢
Sheet, subject to trade discount. 64¢

Solder.
1/4 @ 1/4 (Guaranteed). 15¢
Extra Wiping. 12¢
The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.
Antimony.
Cookson. 12¢ @ 13¢
Hallett's. 12¢ @ 13¢

Plumbers' Brass Work.

Dis. per cent.	
Ground Bibbs and Stops.	55¢ @ 102¢
Ground Stops, Hydrant Cocks, &c.	55¢ @ 102¢
Corporation Cocks.	55¢ @ 102¢
Corporation Cocks, "Mueller" Pattern, from Western list.	55¢ @ 102¢
Ground Basin and Shampooing Cocks.	50¢ @ 102¢
Compression Basin Cocks.	50¢ @ 102¢
Compression Basin and Sink Cocks.	50¢ @ 102¢
Compression Pantry Cocks.	50¢ @ 102¢
Compression Double Basin and Shampooing Cocks.	50¢ @ 102¢
Compression Double Bath Cocks.	50¢ @ 102¢
Compression Bibbs, Urinal Cocks, Sill Cocks, Stops, Hopper Cocks, Hydrant Cocks and Ball Cocks.	50¢ @ 102¢
Basin Plugs and Basin Grates.	55¢ @ 102¢
Bath and Wash Tray Plugs.	55¢ @ 102¢
Bath Wastes and Washers, Bath and Basin Valves, Sewer and Vacuum Valves, Clatern Valves, Pump Valves and Strainers, Ship Closet Valves and Suction Baskets.	55¢ @ 102¢
Basin Clamps, Basin Joints and Strainers.	55¢ @ 102¢
Boiler Couplings, Ground Face, per set.	\$1.35 @ 10
Boiler Couplings, Plain Face, per set.	\$1.30 @ 10
Water Back Valve and Plain Couplings, Soldering Nipples and Unions.	55¢ @ 102¢
Union Joints.	50¢ @ 102¢
Hydrant Nozzles, Handles and Guides, Sockets and Clamps, Street Washer Screws and Guides.	55¢ @ 102¢
Hose Goods.	55¢ @ 102¢

Steam and Gas Fitters' Brass and Iron Work.

Discount per cent.	
Brass Globe Valves.	50¢ @ 102¢
Finished Brass Globe Valves, with Finished Brass Wheels.	50¢ @ 102¢
Brass Globe Valves, with Patent Wood Wheels.	50¢ @ 102¢
Brass Globe Angle and Corner Valves.	50¢ @ 102¢
Brass Radiator Angle Valves.	50¢ @ 102¢
Brass Radiator Angle Valves, Frink's Patent.	50¢ @ 102¢
Brass Cross and Check Valves.	50¢ @ 102¢
Brass Check Valves.	50¢ @ 102¢
Brass Hose Valves.	50¢ @ 102¢
Brass and Iron Frink Valves.	50¢ @ 102¢
Brass Safety Valves.	50¢ @ 102¢
Brass Vacuum Valves.	50¢ @ 102¢
Brass Whistle Valves.	50¢ @ 102¢
Brass Balance, Back Pressure and Foot Valves.	50¢ @ 102¢
Brass Butterfly and Throttle Valves.	50¢ @ 102¢
Brass Pump Valves.	50¢ @ 102¢
Brass Steam Cocks.	57¢ @ 102¢
Brass Service, Meter and Union Meter Cocks.	57¢ @ 102¢
Brass Whistles, Water Gauges & Oil Caps.	50¢ @ 102¢
Brass Hollow Plug, Tallow and Globe Oil Caps.	50¢ @ 102¢
Brass Lubricators.	50¢ @ 102¢
Brass Air Valves.	50¢ @ 102¢
Brass Air Cocks.	50¢ @ 102¢
Brass Gauge Cocks.	50¢ @ 102¢
Brass Cylinder Cocks and Steam Bibbs.	50¢ @ 102¢
Brass Swing Joints and Expansion Joints.	50¢ @ 102¢
Brass Test Pumps.	50¢ @ 102¢
Brass Steam Fittings, Rough.	50¢ @ 102¢
Brass Steam Fittings, Finished.	50¢ @ 102¢
Brass Union Joints.	50¢ @ 102¢
Brass Soldering Unions and Nipples.	55¢ @ 102¢
Brass Hose Fittings, Fusible and Boiler Plugs.	55¢ @ 102¢
Iron Body Globe, Angle, Cross and Check Valves.	55¢ @ 102¢
Iron Body Safety, Throttle, Back Pressure, Butterfly and Foot Valves.	55¢ @ 102¢
Iron Cocks, all Iron.	55¢ @ 102¢
All Iron Valves.	55¢ @ 102¢

Miscellaneous. Discount per cent.
Cast Iron Fittings. 70¢
Plugs and Bushings. 70¢
Malleable Iron Unions. 70¢
Malleable Iron Fittings. 70¢

Paints.	
Black, Lamp—Coach Painters.	1/2 lb 25 @ 34¢
"Ordinary.	5¢
Black, Ivory Drop, fair.	12 @ 15¢
Black Paint, in oil. kegs, 5¢; assorted cans, 11¢	
Blue, Prussian, fair to best.	40 @ 50¢
" " in oil.	45 @ 55¢
"Chinese dry.	70¢
Ultramarine.	18 @ 30¢
Brown, Spanish.	14¢
"Van Dyke.	10 @ 12¢
Dryers, Patent American, ass'd cans, 5¢; kegs, 7¢	
Green, Chrome.	15 @ 20¢
Green, Chrome in oil.	14 @ 18 @ 25¢
Green, Paris.	good, 20¢; best, 25¢
Green, Paris in oil.	good, 30¢; best, 35¢
Iron Paint, Bright Red.	1/2 lb 24¢
Iron Paint, Brown.	1/2 lb 14¢
Iron Paint, Purple.	1/2 lb 24¢
Iron Paint, Ground in oil, Bright Red.	1/2 lb 24¢
Iron Paint, Ground in oil, Red.	1/2 lb 24¢
Iron Paint, Ground in oil, Brown.	1/2 lb 24¢
Iron Paint, Ground, Purple.	1/2 lb 24¢
Litharge.	5¢
Mineral Paints.	3 @ 2¢
Orange Mineral.	10¢
Red Lead, American.	5¢
Red Venetian (Eng.) dry.	\$1.05 @ \$1.75
Red Venetian in oil. ass'd cans, 11¢; kegs, 2¢	
Red Indian Dry.	5¢ @ 12¢
Rose Pink.	10¢ @ 12¢

THE IRON AGE

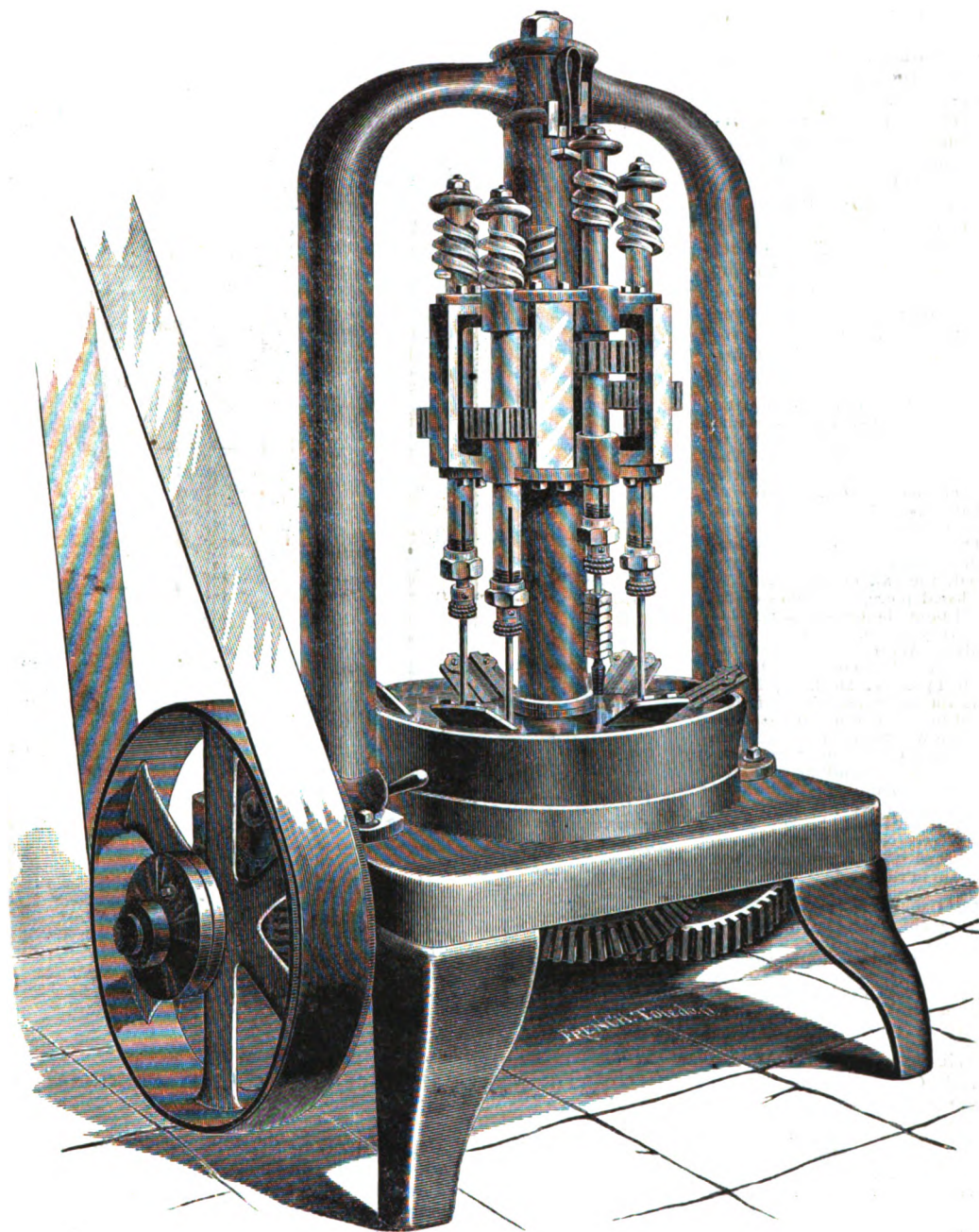
THURSDAY, MARCH 21, 1889.

Automatic Vertical Tapping Machine.

The accompanying engravings show a vertical tapping machine, designed for tapping nuts from $\frac{1}{4}$ inch up to 2 inches, or larger, if desired. The machine is made by the National Machinery Company, of Tiffin, Ohio. They are made in the form

are suitable for $\frac{1}{4}$, 1, $1\frac{1}{2}$ or 2 inch. On the driving shaft is a beveled pinion which drives a vertical shaft in the center of the column. On the lower end of this shaft, just below the beveled gear, is a pinion which meshes with a large spur-wheel shown plainly under the bed-plate of the machine in the sectional view. This large wheel is secured to a vertical shaft, which

a sufficient end motion of the tap spindles to raise the taps out of the nuts, and also to allow them to tap clear through the nuts. At the upper end of each of the tap spindles is a 3-inch pitch double-threaded screw, surmounted by a disk, which is loose on the spindle. On top of the central column is a sleeve, which is prevented from rotating with the column



AUTOMATIC VERTICAL TAPPING MACHINE, BUILT BY THE NATIONAL MACHINERY COMPANY.

illustrated in order to do away with the labor of raising and lowering the heavy tapping spindles, which are made of 2 $\frac{1}{4}$ -inch steel and carry a gear-wheel, tap-holder and filled tap. When revolving, the machine raises each tap as it comes before the operator, who need not be, of necessity, a skilled mechanic. The belt pulley is loose on the horizontal shaft, and is constructed so that it can be made fast to the shaft for light work, or it may be arranged to drive the shaft by an external back gear for heavy work. The speeds

carries another pinion meshing into teeth cast in the lower edge of the pan, which is by this means caused to rotate at the rate of one revolution to 33 of the tap spindle. Allowing 30 revolutions on the tap, there will be some three or four revolutions left after the nut has been tapped, during which, to change the tap, replace the nut, &c. The vertical shaft also carries a large pinion, with very wide face, into which the six gears of the tap spindles mesh. The length of face of the large central pinion is large enough to allow of

by a spring on a frame supporting the top of the center column. This sleeve carries a spiral rack and flat bench, followed by an incline. As each tap spindle comes around its screw engages in the spiral rack, which raises it; when it reaches its highest position the disk on the top of the shaft passes over it and down the incline, the spindle drops down and the tap enters the nut which has been placed for it. The pan is filled with water to within 2 inches of the top, and has $\frac{1}{4}$ inch of oil on its surface. The nut is submerged in oil

while being tapped. The spindles are provided with patent tap holders, which permit of their being removed and emptied when filled with nuts without stopping the machine, which will tap 6000 to 8000 4-inch nuts in 10 hours.

The Redemann-Tilford Steel Process.

For some time past a number of accounts have reached us of a new process for treating steel, brought out in Louisville by the Redemann-Tilford Steel Company, of that city. We have not been able to secure an intelligible description of the method itself, which appears to consist of heating steel to a certain temperature, according to the results to be obtained and the character of the metal. The heated steel is then plunged into a "chemical composition," in which it is allowed to cool. H. J. Tilford, the secretary of the company, has forwarded to us a number of documents to show what has been accomplished. It appears that an application was made to the Pittsburgh Steel Casting Company for some of the metal from which the cast gun was made. They had none of it left in convenient pieces, but forwarded pieces from a 9-ton wheel, which was approximately the same metal. After treatment they were returned, the Pittsburgh Steel Casting Company reporting on the matter as follows:

Our superintendent, Mr. Hainesworth, who examined them, noticed small cracks on end where drilled and expected them to fly to pieces with light blow of hand hammer. The foreman was instructed to test them under a 1000-pound steam hammer, with a pressure of steam estimated at 70 pounds on a 12-inch piston, which, of course, exerts a greater force than the weight of ram itself. The pieces were placed on support 6 inches apart, as shown on sketch inclosed, the fall of ram being 14 inches. The hardened piece, 2½ inches diameter, was struck 11 blows before breaking; this we considered a very strong piece of steel; grain fine and silky. We could not machine the outside, but could drill in end after breaking. The toughened piece of steel, 2½ inches in diameter, was the strongest piece of steel our superintendent has ever seen. It stood the following test: 17 blows steam hammer; then piece reversed and struck 14 blows steam hammer; no break; then nicked all around and struck 10 blows steam hammer; 8 blows 280 pounds weight falling 24 feet; 1 blow 1950 pounds weight falling 24 feet; broke; grain fine and silky. A piece of each will be expressed to you, marked *88. It certainly was a remarkable change in the steel.

A report of tests made at the works of Carnegie, Phipps & Co. gave the following:

	Toughened.	Hardened.
Tensile strength.....	88,820	98,600
Elastic limit	48,870	83,600
Elongation.....	9 % (in 2 in.)	0.06 % (in 4 in.)
Reduction of area.....	14.04 %	none.

In an affidavit made by G. W. G. Ferris, of Ferris & Co., inspectors, report the following as the results of tests made by him:

	Treated.	Untreated.
Elastic limit.....	96,720	50,320
Maximum load.....	141,700	72,460
Elongation:		
In 4 inches.....	8.25	8.00
In 8 inches.....	5.50	11.00

A later test showed an elastic limit of 118,850 pounds and a maximum load of 167,250 pounds per square inch, with an elongation of 6 per cent. in 4 inches.

So far as the chemical changes are concerned, the following analyses were reported by W. L. Abbott, of Carnegie, Phipps & Co., Limited:

	Carbon.	Silicon.	Sulphur.	Phosphorus.	Manganese.
Treated and annealed.....	0.46	0.061	0.058	0.100	0.89
Treated bath.....	0.46	0.049	0.05	0.098	0.92
Tempered water.....	0.20	0.042	0.074	0.148	0.90
Not treated.....	0.25	0.042	0.062	0.150	0.90

Dr. Fricke, of Carnegie, Phipps & Co., Limited, reports the following:

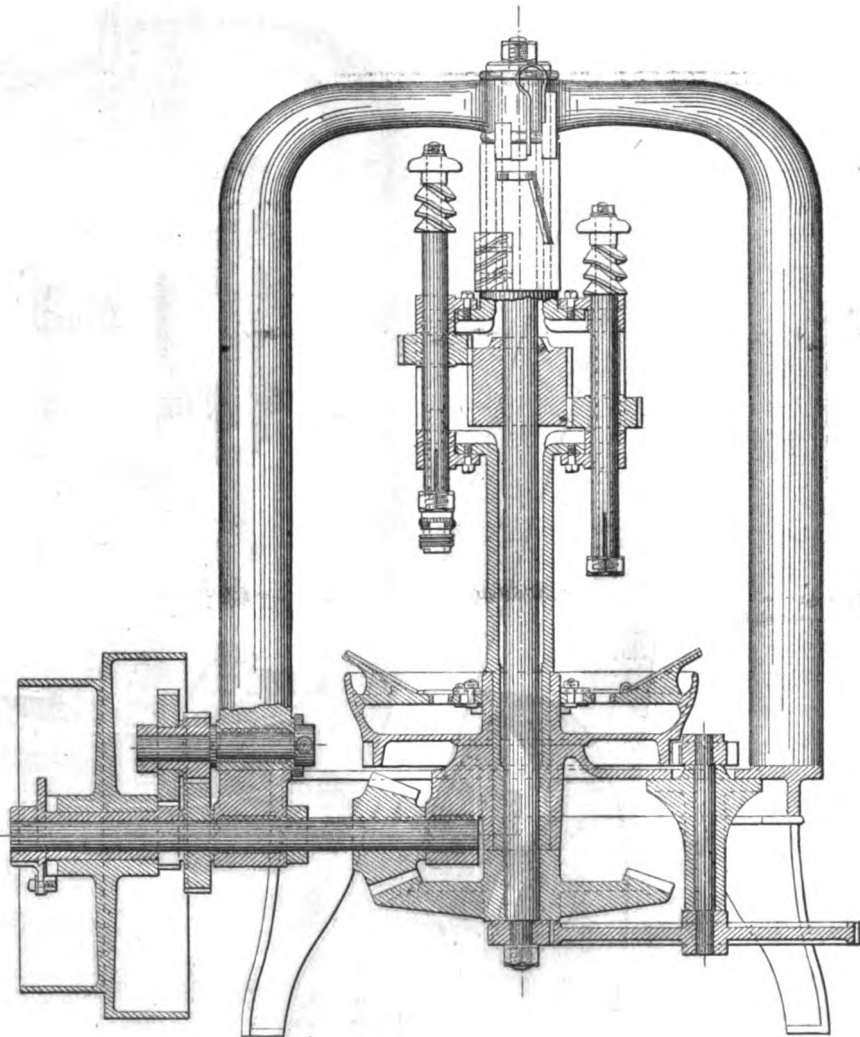
	Treated B.	Not treated.
Carbon.....	0.45	0.28
Silicon.....	0.040	0.044
Phosphorus.....	0.110	0.162
Sulphur.....	0.052	0.072

The samples were received through J. B. Booth & Co.

Manual Training.

The subject of industrial training is treated thoughtfully in a report to the Pennsylvania Legislature by a commission appointed by that body, comprising the presidents of the Pennsylvania State College,

branch of the general school system, or of a special course in connection with one or more schools. The manual training schools introduce into their curriculum the same educational studies as are found in other schools, and aim thus to develop the intellectual faculties not less than the physical. In the same way shop-work, when introduced as a part of the prescribed course of any public school, is not allowed to diminish the amount of attention given to other studies; and it is found that the school time which would thus at first sight appear to be lost to those studies is fully made up and often more than made up by the increased freshness, aptitude and mental alertness which the pupil acquires from his manual exercises.



AUTOMATIC VERTICAL TAPPING MACHINE.—SECTIONAL ELEVATION.

the president of Girard College and others well qualified to investigate the subject. The commission prepared a bill for the general introduction and maintenance of a system of manual training in connection with the public schools, and ask for an appropriation of \$500,000 to carry their scheme into execution.

The new movement for popularizing manual training as a part of public school instruction, the report states, began about ten years ago with the establishment of the St. Louis Manual Training School. Since that time, but particularly within the last five years, it has spread very rapidly, until it has come to be a factor of the greatest importance in public education in many parts of the country. An account of the most important institutions of this kind in the United States appears in the appendix to the commission's report. Some of these institutions are of a special character, privately supported, and others form a

The commission are persuaded that manual training processes in the public schools have become well enough established to enable any community to enter upon them intelligently and successfully; that the training involves no great expense or difficulty, and that it should be introduced as rapidly as possible into every grade, beginning with kindergarten work. It will not diminish the vigor and efficiency of the public schools, but will increase both; it will not divert our children away from industrial pursuits, but direct them toward them; it will not result in the teaching of trades by the public schools, but will train the body of youth intelligently prepared to enter upon all trades; it will not interfere with the highest intellectual training of those who are designed for professional pursuits, but will give a body of common knowledge and common skill which will be of incalculable value to the students of all professions; it

will not lower the standard of instruction, but will elevate it; and apart from its influence on the schools, it will help to give dignity and efficiency to every form of useful labor. Wherever an attempt has been made to introduce manual training into the public schools—whether in a special school, as in Philadelphia, or in the general system, as in New York, New Haven and many other places—whether it has been supported by appropriations from the municipal treasury or by private contributions of public-spirited citizens, the result has been the same; teachers, pupils and parents vie with each other in their testimony to its healthful and beneficial influence.

48-Inch Hydrostatic Car-Wheel Press.

In this press, which is made by the Putnam Machine Company, of Fitchburg, Mass., the ram has two speeds. The

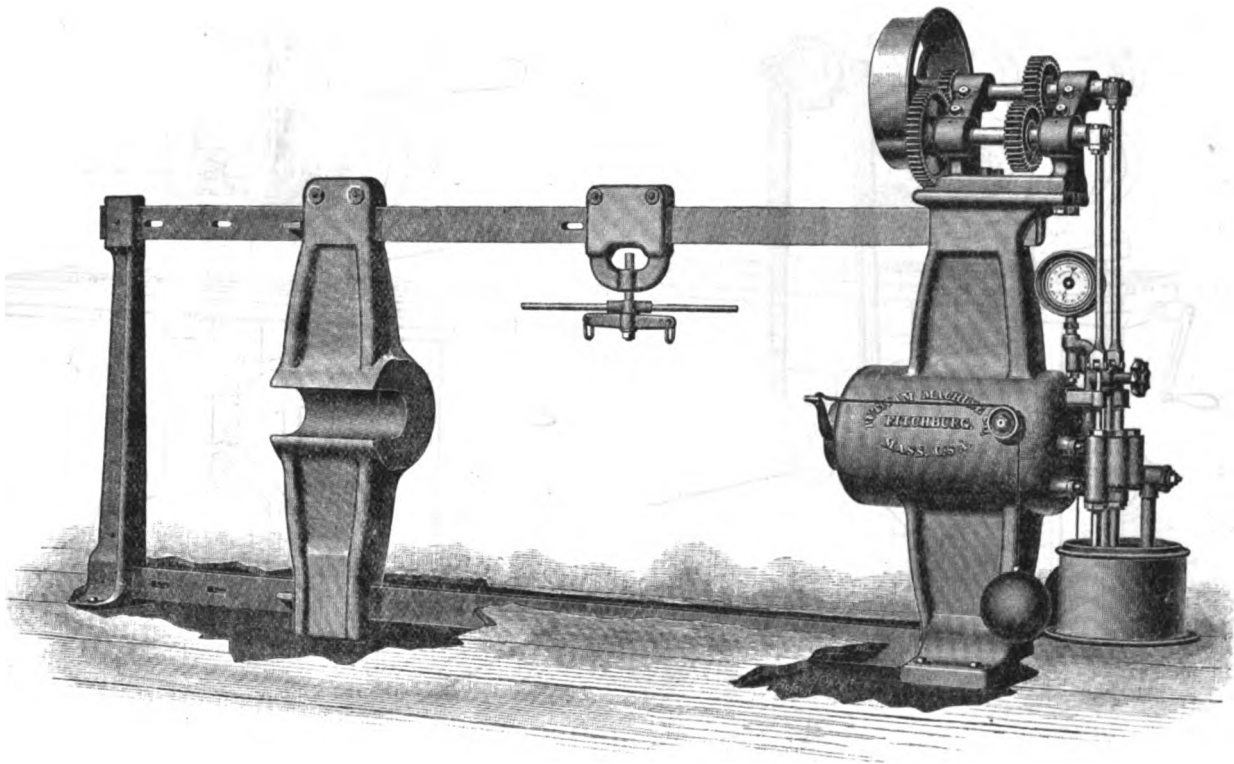
tons. Adding Georgia we make a total of 65,000 tons. In January the output was 66,575 gross tons, thus showing an increase from 2147 tons a day in January to 2328 tons a day in February.

Turner, Dickinson & Co.'s New Foundry.

Among the recent additions to the manufacturing establishments of Chicago is the foundry of Turner, Dickinson & Co. It is located on the Omaha branch of the Chicago, Milwaukee and St. Paul Railroad, very close to Holstein Station, at which all passenger trains stop. The lot is 816 feet long by 132 feet wide, and is bounded by Hoyne avenue, Churchill street and Zelma place. These streets and the railroad running alongside the property prevent the erection of other buildings close enough to interfere with light and ventilation. Over half of the lot is retained for yard

the walls of the building. The roof is also strengthened by trusses placed outside of the building instead of taking up valuable space inside. The entire ground floor of the molding-room is entirely free from pillars, permitting the unobstructed use of the cranes. The central space between the hanging floors is 52 feet by 60 feet, and its height enables a large swinging crane to be put in, which reaches over its entire area and has a lifting capacity of 15 tons. An unusually large ventilator with large windows runs the full length of this central section. Light molding or snap work will be done on the hanging floors, which so greatly increase the available space that 62 molders can easily work in this one room.

The cupola stands outside of the molding room, in one of the rooms between it and the yard. An elevator conveys stock to the cupola from the yard. It is of the ordinary pattern and will melt 25 tons a day. A



48-INCH HYDROSTATIC CAR-WHEEL PRESS, BUILT BY THE PUTNAM MACHINE COMPANY.

plunger of the quick-acting pump is 24 inches, and of the high-pressure pump $\frac{1}{4}$ of an inch. Both plungers act in concert to a pressure of 15 tons, after which the smaller one does the work up to a pressure of 150 tons, if required. This gives a double quick action to the ram up to the point when the larger plunger ceases to work. The cylinder is lined with copper, and the ram is 84 inches in diameter and has a run of 20 inches. The foot-block is suspended on rolls and is adjustable to position. The press weighs 7500 pounds and is furnished with roller lifting jack, pressure gauges, lock-up safety valve, liquid tank, return weights and counter-shaft having tight and loose pulleys 18 inches in diameter by 5 inches face.

In February 18 coke furnaces, which were in blast a part or the whole of the month in Alabama, produced 41,094 gross tons of pig iron. One furnace did not report its output, which is estimated at 3200 tons, making a total of 43,294 gross tons. It must be remembered that the month had only 28 days. In the same time the Tennessee blast furnaces produced 20,008

purposes, into which a side track runs for the convenient receipt of stock and shipment of goods. Sheds are built on both sides of the track for the storage of sand, coke, wood, &c. The arrangement of the foundry buildings is peculiar and worthy of detailed mention. They are built of brick, with gravel roofs, and have as many windows in the sides as a due regard for the strength of the walls will permit. The entire ground space covered is 100 feet by 132 feet, the buildings extending the full width of the lot. A depth of 40 feet next to the yard is one story high, and is divided into a number of rooms, including the shipping-room, cleaning-room, tumbling-room, cupola-room, case-room, engine-room, pattern-room, machine shop, &c. The remainder of the structure, 60 feet deep by 132 feet long, is the molding-room, extending a height of 50 feet in the clear in the center and 30 feet on the sides. This room is unusually light, and its height enables a hanging floor, 40 feet by 60 feet, to be constructed on each side, midway between the roof and the ground. These floors are suspended from the roof and are also partly supported by heavy trusses extending along their inside edges between

Baker blower is used. Another cupola is shortly to be erected at its side which will have a capacity of 10 tons. A Buckeye automatic cut-off engine of 60 horse-power operates the blower, tumbling barrels and other machinery, consisting of drills, bolt cutters, taps, &c., used in finishing. The core-oven is 17 feet long, and is fitted with a railroad track, so that an iron car can be loaded with cores, pushed in, and after the cores are baked it is drawn out, saving the handling of the cores.

A specialty of light fine castings is made by these works, and their products are consequently of a miscellaneous character, running from hardware to piano frames, embracing door hangers, fire-escape platforms, steps, round-house hoods, &c. The manufacture of the latter is especially difficult, as the castings are very thin yet of large size. To be used in connection with these hoods cylindrical pipes are cast running from 2 to 6 feet in length, 20 inches in diameter and but $\frac{1}{4}$ inch thick. Although composed of young men, the firm are doing very creditable work, overcoming difficulties which have prevented older establishments from rendering entire success to their patrons.

Universal Milling Machine Attachments.

In our issue of January 17, 1889, we described and illustrated a universal milling machine built by Pedrick & Ayer, Philadelphia. In this issue we present several engravings intended to show the method of working several important attachments. In Fig. 1 the cutter arbor supporting bar is run out, and is provided with center support and bracing harness, which prevent any tremor of the bar. On the arbor is a 12-inch inserted tooth mill, suitable for milling and sizing out between flanges of castings, &c. The harness is also used when large cutters are placed a long distance from the spindle, or when heavy boring is done. The slots in the braces (these are upside down in the cut) allow the platen to be raised or lowered by simply loosening the two screws. The four following cuts show the work that may be done with the vertical or angular attach-

at an angle bevel gears may be cut. Spur gears up to 5 feet in diameter can be cut with this attachment. Fig. 2 shows the attachment arranged for drilling holes parallel with the platen. In Fig. 3 a V-block is being milled at an angle of 90° , the horizontal feed being used. By using other tools the whole piece can be finished with one chucking except the base. Fig. 4 shows how angle cutters can be milled and bevel gears cut. The index head can be turned around to any angle. With work held in a chuck, hollow mills, counter bores and a great variety of tools can be cut in this position. The index has a circular base, with a graduated plate with a tongue fitted to slot in milling machine platen. When in use for ordinary straight milling a spring pin holds the head square; for angular work the pin is pulled out of position from the bottom index-plate, which is divided into 360 divisions—a feature that will be appreciated. The head is centered to bottom plate by a king

angle. The jaws, of hardened steel, are 8 inches, with a depth of 2 inches, opening $5\frac{1}{4}$ inches. Fig. 6 represents the machine used as a horizontal boring mill. By extending cutter arbor supporting bar and using a fixture with bushings to receive the boring bar holes 12 inches deep can be bored out. By substituting a traveling head boring bar with an automatic feed on the outer end cylinders from 8 to 14 inches can be readily bored out. The knee platen and bearings are of sufficient strength to support heavy weights, and the machine has power enough to drive the bar with heavy cuts.

Electric Welding.

By invitation of H. A. Royce, general manager of the Thomson Welding Company, of Lynn, Mass., members of the Boston press witnessed an interesting exhibition of electric welding at the station of the Malden Electric Company, Malden,

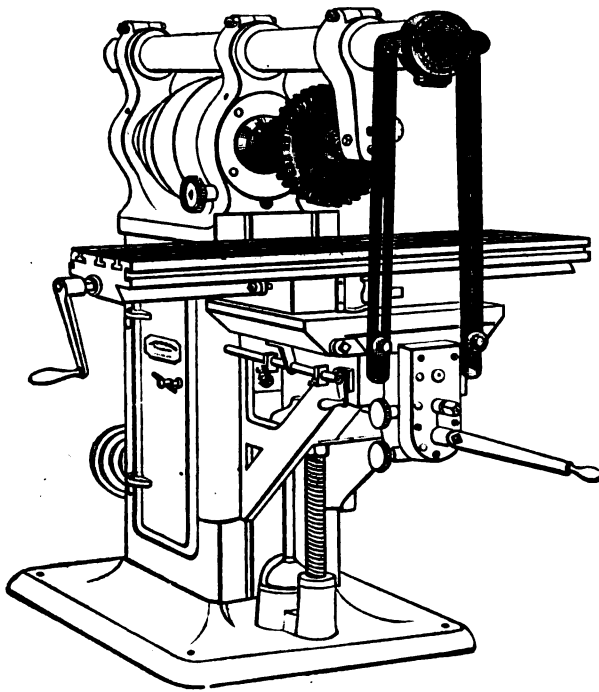


Fig. 1.

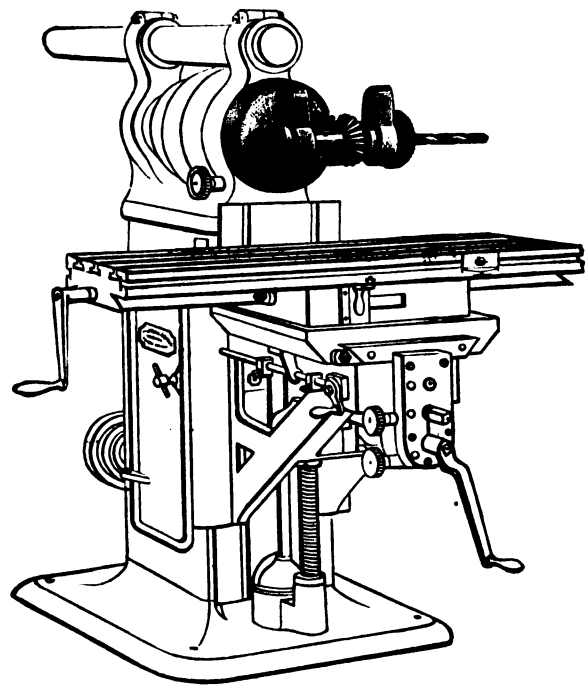


Fig. 2.

UNIVERSAL MILLING MACHINE ATTACHMENTS, BUILT BY PEDRICK & AYER.

ment, which is secured to the head of the machine by four bolts. It is driven by a socket fixed in the spindle of the milling machine, which is key-seated to fit the keyed stud in the attachment. Through the medium of a pair of miter-wheels this stud drives a spindle at right angles to the vertical attachment. This spindle is geared with a shaft in line with it, which is utilized as a cutter or saw arbor for cutting racks, sawing up stock, &c. This shaft runs in bronze bearings, and can be removed from the attachment by means of the two clamp-screws in the clamp bearings. This attachment can be used either vertically, horizontally, or at any angle around the center, the base being graduated to register its position. Cutter arbors or boring bars can be used in either end of the main spindle. For rack-cutting there is no limit as to length, while for boring or milling castings of irregular shape or troublesome to hold in other tools it will be found very useful. In cutting large gears the cutter spindle is placed vertically and the index head at right angles to the platen. The gear blank is then fed in line with the main spindle of the milling machine. By setting the platen

bolt, and is held to platen in its various positions by two steel bolts and clamps. The spindle is of steel, 8 inches in diameter, threaded to receive a chuck-plate; it has a taper reamed hole through it from 2 to $1\frac{1}{4}$ inches at small end. The worm and worm-wheel are accurately made and compensating for wear. For cutting spirals the worm gets its motion from a pair of spiral gears instead of miter or bevel gears; they are inclosed to exclude the chips and dirt; the index wheel is also completely covered for the same purpose. Spirals, either right or left, can be cut. Bevel gears and bevel cutters can be cut on this head with the vertical and angular attachment. The universal vise shown as an attachment in Fig. 5 is adapted to swing from a horizontal to a vertical plane or at any angle therein. A graduated plate, with a central stud, fills the hole in the base of the vise, enabling it to be set at any angle. It can be held in any position on the trunnion by clamping the body of the vise with the two nuts shown in the cut. A graduated dial on the trunnion, marked by degrees, gives the angle to which the vise can be thrown, facilitating the milling or planing of work at an

Mass., on Monday evening, March 4th. The following experiments were successfully made on three machines of graduated capacity, welding $\frac{1}{8}$ -inch copper rod, $\frac{1}{4}$ -inch brass rod, $\frac{1}{4}$ -inch iron rod, 1-inch iron rod, 2-inch iron rod and 2-inch iron pipe. The operation consumed from 8 to 75 seconds, according to the size of the pieces welded. To show the strength of the weld, a rod was twisted until it broke, but not at the welding point. The welding plant consists of a dynamo of special construction, wound for supplying alternating currents of 800 volts potential, and three welders or welding coils, which are so constructed as to transform the currents supplied by the dynamo into currents of very low electric motive force. The welders consist of a core of iron composed of disks of sheet iron bolted firmly together, through the center of which passes a copper tube, constituting the secondary of the machine. Coils of fine copper wire are then inserted through the tube or secondary and over the core of iron, the fine coils forming the primary of the machine. The currents from the dynamo are sent through the primary coil, and by induction heavy welding currents of low electric-motive

force are generated in the secondary. These currents are made to pass directly through the pieces to be welded, and when the metal is heated pressure is applied and the weld thereby completed.

These machines were illustrated some months since in *The Iron Age*, but since that time they have been modified so as to

The New Appraiser's Stores.

It appears from Washington dispatches that the vexed question concerning the location of the appraiser's stores in this city has been finally settled by a decision of the Treasury Department favoring the up-town location. This selection is in ac-

size of the present stores on Laight street, a few blocks below. The price paid is less than \$500,000. When the improvements contemplated by the Dock Department on Thirteenth avenue are completed, between West Eleventh street and Twenty-third street, the new stores will front on the river. The buildings that occupy the

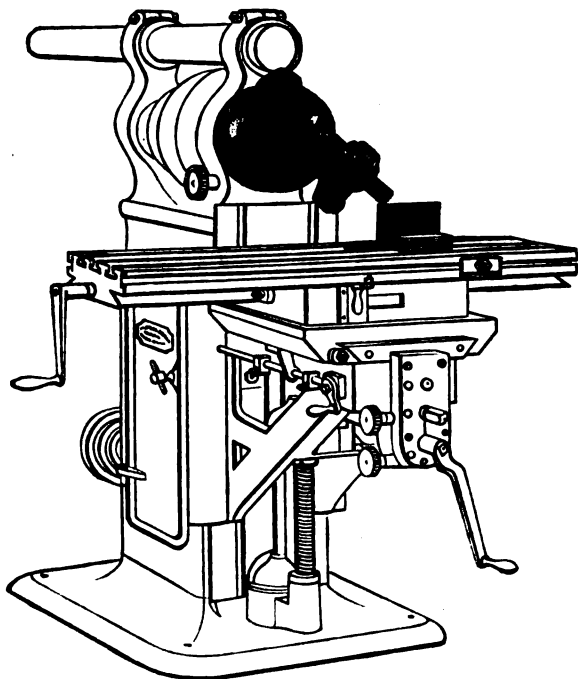


Fig. 3.

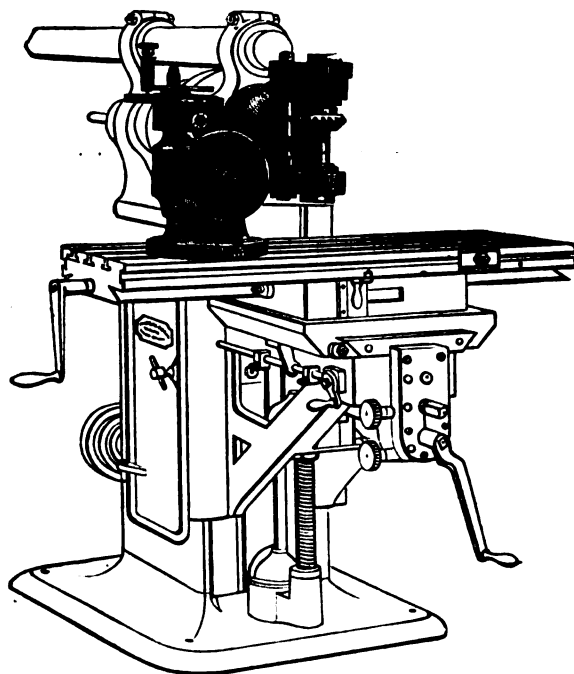


Fig. 4.

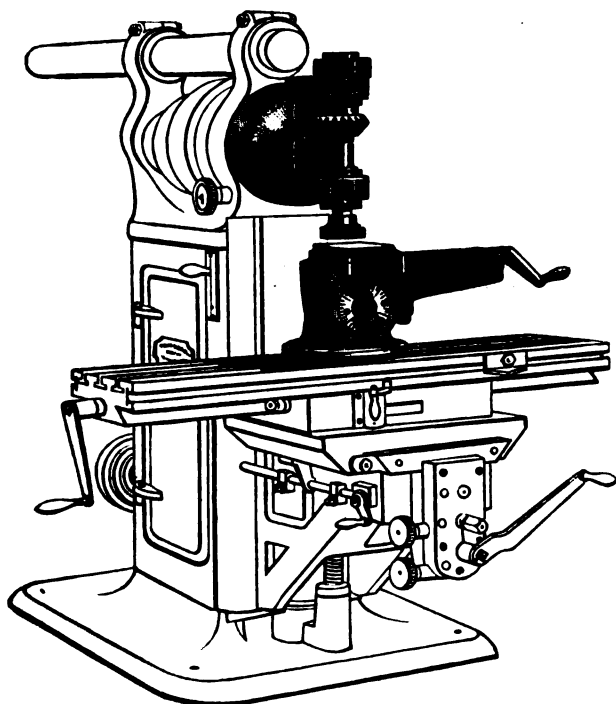


Fig. 5.

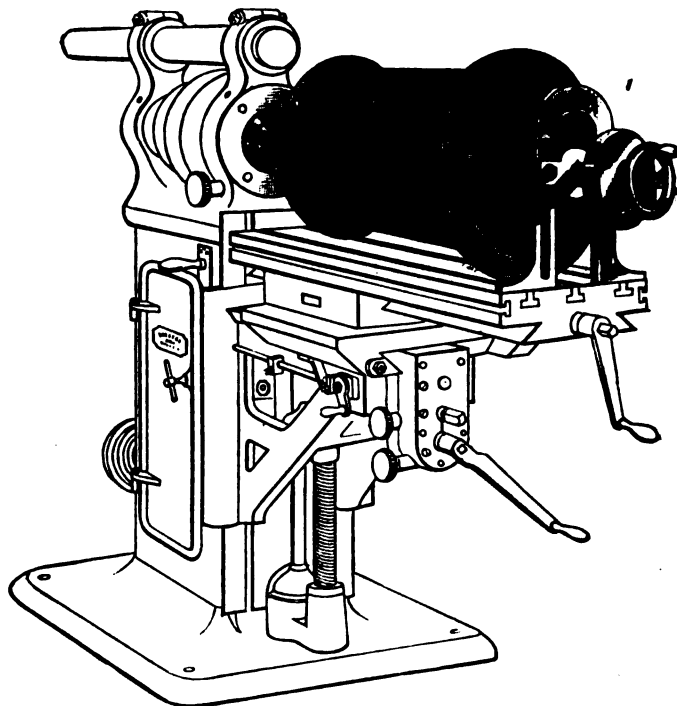


Fig. 6.

UNIVERSAL MILLING MACHINE ATTACHMENTS, BUILT BY PEDRICK & AYER.

be scarcely recognizable. They now are adapted for riveting, forging, and shaping metals. Three of the machines are to be sent to the Paris Exhibition, together with an interesting collection of samples showing the work done. Mr. Royce presented to the gentlemen present a souvenir of the occasion in the shape of a single bar composed of copper, brass, German silver and iron welded together by the electric process.

cordance with the recommendations of the New York Chamber of Commerce, and the contract for the purchase of the site now made is the conclusion of negotiations pending when Mr. Fairchild vacated his office. Nothing remains but to perfect the title and erect the necessary buildings. The site purchased is the block bounded by West, Bank, Bethune and Washington streets, convenient to the wharves of the principal steamship lines, and is twice the

site at present are tenanted by the Star Card Company, T. & R. Patterson, lumber dealers; the De la Vergne Refrigerator Machine Company, the Whiting Putty and Paint Works, W. H. Dougherty & Co.'s iron works, a box factory, a rubber-paint works and John J. Budd. The frontage on West street is 285 feet depth, on Bethune street 360, on Washington street 230 and on Bank 370, and the area is about 93,000 square feet, or over two acres. The

decision now reached must commend itself to the judgment of all merchants who have observed the tendency of the foreign commerce of the port to concentrate on the North River side of the city, midway between the upper and lower sections and at a point not far removed from the prominent business center. It now becomes of the first importance to erect a structure commensurate with the requirements, present and prospective, of the leading commercial emporium of the United States, one that shall be not only commodious but practically indestructible by fire or the lapse of time, and which shall command every facility for transacting business expeditiously and at the minimum of expense. Architectural effect is a minor consideration, but cannot be wholly ignored.

W. B. Belknap.

Few men not in public life had so wide a circle of acquaintance, and few in any station have been more sincerely mourned than William B. Belknap, whose death is announced at Louisville, Ky., February 24, in the 78th year of his age. Prominent as he has been in mercantile and manufacturing enterprise in the West and South, he was socially almost as well known in the East, whither his journeyings in search of health and necessary recreation frequently brought him in his later years.

Mr. Belknap's early life intimately associated with the first beginnings of the great iron manufacturing industry of Pittsburgh. He was of the family that gave to the world the well-known Dr. Jeremy Belknap, the historian of New Hampshire. His father, Morris B. Belknap, who as well as the son was born in Brimfield, Mass., was a man of versatile talent. While by preference devoted to science, he studied at one time law and at another time divinity at Harvard College. But more than all he was impelled by that spirit of restless activity which Washington Irving so humorously describes as characteristic of the typical Yankee. Married in 1807, he moved in the same year to the frontier at Marietta, Ohio, where he knew intimately both Aaron Burr and Blennerhassett, visiting the latter at his island home, and leaving on record his belief that the famous "Burr's Expedition" was not undertaken with any treasonable intent. From Marietta he went to Lexington, Ky., and returned to Brimfield in 1810. From Brimfield he moved again to Worcester, Mass., where the strong bent of his mind toward science and mechanics led him to engage in manufacturing. Still another move was made in 1816, when he went to Pittsburgh, Pa., where at once, without previous experience in anything of the kind, with no models before him, and without skilled assistance, he set himself to what became his life-work, the construction of furnaces and rolling mills. The first rolling mills of Pittsburgh were built under his supervision, and there still exists at least one of his structures, which with little if any alteration is running and doing good work to this very day. The so-called skilled workmen that were imported from England proved so incapable that Mr. Belknap was forced to take the tools from their hands and show them—and he showed them successfully—how to do what he himself had never seen done.

After 11 years of sound, honest work Pittsburgh was fairly started, with no small obligation to this man's genius, on the road to manufacturing wealth, and it was time for another move. He heard of the rich mineral deposits that lined the shore of the Cumberland and Tennessee rivers. He started for Nashville, where, armed with cordial letters from Andrew Jackson, whom he visited at the Hermitage, he proceeded alone and on horseback to explore the spurs of the Cumber-

land Mountains and other portions of the State. As a result of his investigation reported to the bankers Yeatman, Woods & Co., of Nashville, the latter gentlemen determined to erect furnaces and a rolling mill in Stewart County, and here the subject of our sketch, Wm. B. Belknap, was called upon at the early age of 18 to begin his long and successful business career.

His father had left his wife and six children, of whom William was the oldest, at their country home on Pine Creek, near Pittsburgh, while he was prospecting in Tennessee. William was going to school to the Rev. Jos. Stockton, in Allegheny, but doubtless he had got the most valuable part of his education at play among the driving wheels and rolls of his father's big mills, which he had watched him construct and put into operation. He was already in his early teens a sort of *pater familias*, and the younger children looked up to him as they continued to do through life. The order came to him from his distant father to select and purchase the machinery for an iron furnace, and to come to him from Pittsburgh, bringing with him machinery, household furniture, family and all. One can well believe that that must have been an extraordinary youth on whom a father could venture to impose such a formidable task. But the machinery was judiciously bought, and the lad, with his valuable freight, animate and inanimate, was soon voyaging down the Ohio. He left behind him delightful memories of his school days and of his intimate fellowship with other bright boys, like his lifelong cronies, Geo. K. Shoenberger, of Cincinnati, and John H. Shoenberger, of Pittsburgh, weighty names subsequently in the iron industry and in the development of those great cities. He kept a warm corner in his heart always for his boyhood friends, and those friendships became subsequently an important factor in his business career.

Reaching the falls of the Ohio at Louisville, where there was then no canal, the boat had to be relieved of her cargo to enable her to pass the rapids. Young Belknap saw to the unloading of his heavy machinery, to its carting through Louisville to below the falls, and finally to its loading again at Shippingport. It was a tedious job, taking two or three days before the boat was again on her way to the mouth of the Cumberland. The landing place on the Cumberland River—no town, but a ferry crossing only—was reached in the night-time, and our schoolboy delivered the family furniture and the machinery all safe and sound to his father, awaiting their arrival on the river bank. But Dr. Joseph Stockton's pupil was no schoolboy now. No university could have educated him so fast as that trip down the river. When he arrived at that river landing he was already a man, and ready to do a man's part in the world. For two years he assisted his father, disbursed the money and attended to much of the business incident to building and running several furnaces, which, including the Hillman and other leading charcoal furnaces, are still in operation and noted for the quality of their iron. He was feeling advanced and mature, we can imagine, when he attained his nineteenth birthday, and, knowing that his father would keep on all his life building furnaces and rolling mills for sheer love of it, he obtained permission to mount a horse and seek his fortune wherever it might be awaiting him.

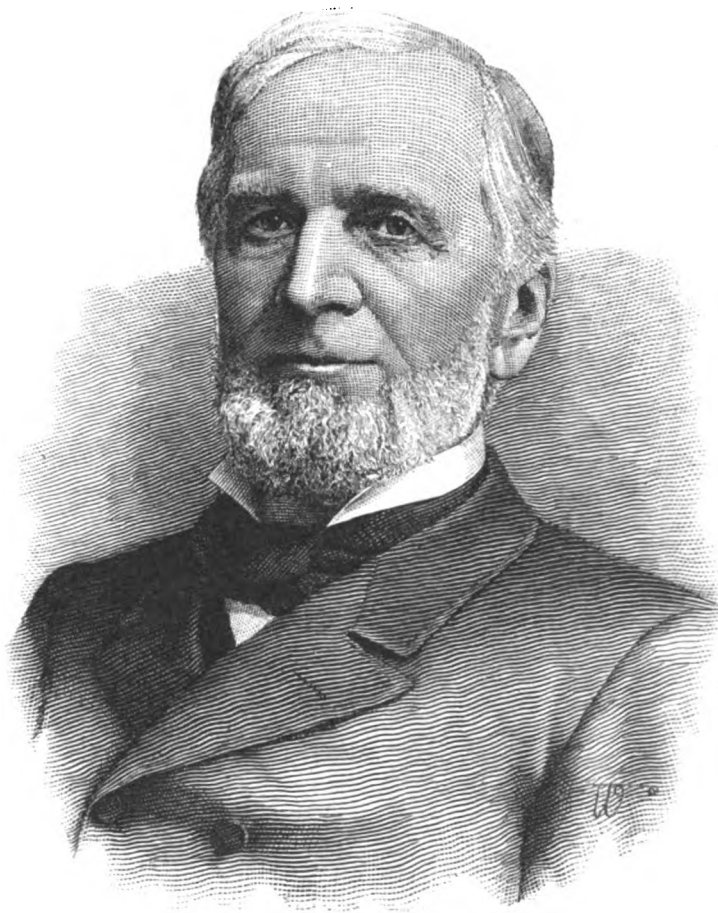
He found it for the time being at Hickman, Ky., then called Mill's Point, on the Mississippi River, about 40 miles below Cairo—a fertile but then unwholesome section, where he made money in merchandising, but lost his health. At first in business for himself, he subsequently associated himself with two young men from Louisville, Ky., and, expanding their operations, a branch house was established

at Moscow, and still another later at Vicksburg, Miss., of both of which Mr. Belknap had charge. In a few years a snug little fortune, as was supposed, had been made for all the members of the firm, and Mr. Belknap sold out to his partners; but before a settlement could be made the fierce financial revulsion of 1838 swept over the country, and the three young men who had thought themselves passing rich were wholly bankrupt. His bankrupt debts Mr. Belknap subsequently discharged dollar for dollar, as fast as he could earn money to pay them. It is not an unmixed evil for a young business man to be roundly bankrupted early in his career. It is better to have lost and paid than never to have lost at all. Mr. Belknap's money was gone, but a valuable lesson remained, which enabled him to weather subsequent financial storms with hardly the loss of a spar. And now he must wander, like his father before him. He goes to Texas, then to St. Louis and to Cincinnati; but finally, in 1840, he settles down in Louisville, Ky., as agent of his boyhood friends, G. K. & J. H. Shoenberger, of Pittsburgh.

In 1848 he married Miss Mary Richardson, daughter of William Richardson, president of the Northern Bank of Kentucky. In 1847, having prospered in business, he bought, in conjunction with Capt. T. C. Coleman, a partly built rolling mill, which they completed and entered upon the manufacture of iron of such superior excellence as speedily built up a reputation all over the South and laid the foundation for several Louisville fortunes. His separate merchant business of iron and heavy hardware was kept up under the firm name of W. B. Belknap & Co., in which he was associated with his brother, Mr. Morris L. Belknap. The firm has since expanded into the corporation of W. B. Belknap & Co., managed by his sons and his son-in-law, and well known as one of the most important hardware houses south of the Ohio River.

His mature life has been identified with the development of Louisville. Caring nothing for public honors, he was earnestly devoted to its welfare. No new scheme for promoting it wisely could be broached, as by charitable institutions, by libraries, by manufacturing enterprises, large or small, to which he was not ready to give both his money and his time. He was active in the Sanitary Commission, the Refugee Commission and other beneficent agencies of the war period. He was never afraid of the laboring oar. His charities were constant, but quiet always and avoiding publicity. He was especially fond of intellectual companionship, and few men of distinguished merit visited Louisville without receiving invitation to his hospitable board. During the war, in which he earnestly espoused the Union side, he virtually kept open house for the brilliant throng of federal officers of whom Louisville was headquarters. The list of those entertained by him would embrace the most distinguished names that illumined the battle-fields of the Southwest, from Grant, Sherman, and Thomas down through a multitude of worthy subordinates. All over the Union are men who will long remember the gracious figure of their host—for Mr. Belknap was a man of strikingly handsome and dignified appearance, and the most courteous manners based upon innate refinement and goodness of heart. It is pleasant to think that in his old age he had all that can best console declining years, as "honor, love, observance, troops of friends."

C. P. Huntington, the railroad magnate, is credited with having bought 1,000,000 acres of land in Lower California, where he is building a railroad, and is said to contemplate a development of that section of country.



WILLIAM B. BELKNAP.

The Buffalo Exhaust Fan.

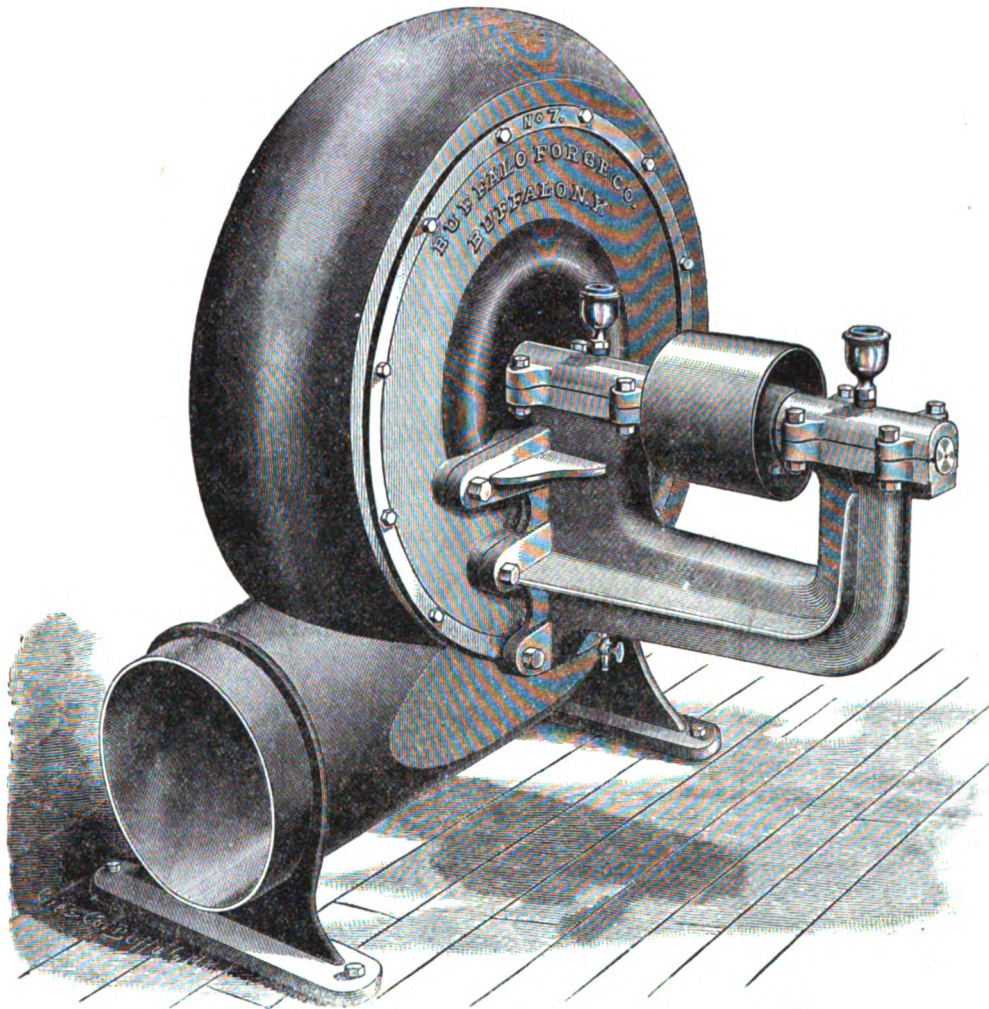
The peripheral portion of the shell or case of this fan is cast in one piece, to which the center plates are fitted, metal to metal, without the interposition of any foreign substance whatever. The Buffalo Forge Company, of Buffalo, N. Y., the makers of this fan, claim as the result of this construction that the fan is practically one piece, and that, under any service, the bearings must always be in perfect alignment with the rest of the machine. The journals are long and heavy and are supported by the arm having planed surfaces fitted accurately to the body of the fan. By a perfected system of gauges and templates it is claimed the

jectiles fired at them at a distance of 30 feet from the muzzle, but the compound armor showed the best results.

A New Brass Mill.

We have alluded in the past to the fact that a new brass mill is in course of construction at Bridgeport, Conn., by the Aluminium Brass and Bronze Company. Those identified with it are men long connected with the metal industry of the Naugatuck Valley, the president being Frederick J. Kingsbury; the treasurer, William Powe, for many years with the Ansonia Brass and Copper Company; the secretary, Frederick J. Kingsbury, Jr., and the me-

carry a pressure of 125 pounds per square inch. In immediate proximity to it is to be the 1000 horse-power compound engine, the largest yet constructed by the builders, Watts, Campbell & Co., of Newark, N. J. The main shaft of this engine drives the seven sheet trains, which are located in the main building, which is 267 x 84 feet. The wire rod train is placed in the lower right hand l, 76 x 70 feet, which also contains two heating furnaces. The main engine drives also the slitting machine and the wire-drawing benches, which are placed along one wall of the main building. The muffle-room, 120 x 84 feet, is located in the upper left hand l, the shipping-room, 51 x 60 feet, being alongside of it. The independent structure



THE BUFFALO EXHAUST FAN, BUILT BY THE BUFFALO FORGE COMPANY.

different parts of the fan are so well proportioned and fitted each to the other that at the highest speed there is practically no vibration. Both bearings of the exhaust fan are on one side, leaving the inlet entirely unobstructed.

Charles A. Ashburner has just submitted to the United State Geological Survey a preliminary statement showing that the total production of coal of all kinds increased from 129,975,557 short tons in 1887 to 145,363,744 tons in 1888. The value in 1887 was \$182,556,887, which increased to \$208,129,806 in 1888.

In the trials on board the Nettle, at Portsmouth, England, to determine the relative efficiency of compound (or steel-faced iron) armor and solid steel, two samples of compound and eight of solid steel armor were tested. Two of the solid 10-inch plates withstood the Palliser pro-

chanical superintendent, Charles S. Morse, who has also extended experience in brass manufacture. Dr. Leonard Waldo is electrical engineer. The principal aim will be to produce a high grade of sheets, rods and wire, with the aid of silicon and aluminium alloys, under the Cowles patents. The plant is located on an 8-acre tract on the Housatonic Railroad and the Pequannock River, and is expected to be in operation toward the end of May or early in June. The main buildings are now completed, being of brick, with a very handsome iron roof built by the Berlin Bridge Company, of East Berlin, Conn. The buildings have the following form:



The L on the lower left, which is 58 x 64 feet, contains six boilers built by William Lowe, of the Bridgeport Boiler Works, to

shown in the sketch has the casting-room, the metal storeroom, and the cabbaging-room in an upper floor, the cabagging being the compression of scrap by hydraulic presses preliminary to its introduction into the melting pots with new stock.

Beginning at the casting house, which is 153 x 62, and contains 40 furnaces, one of the main features as a departure from the ordinary practice is that the slabs and bars cast will not be raised from the pit, but will be allowed to drop into the story below, thus avoiding a good deal of labor. They are carried directly to the rolling mill in cars, the track being on the same level.

In its rolling mill practice the new works will differ very widely from the generally accepted methods. Aluminium and silicon bronze and brass are considerably harder than the corresponding common alloys. The company propose first to adopt a combination of the brass and copper practice—that is, it is the intention to break

down hot and finish cold. Then their machinery is designed much stronger than is usual, and will be run at higher speed. It is being built by the Waterbury-Farrell Foundry and Machine Company, of Waterbury, Conn., of whose work the company speaks in strong terms, and the Farrell Foundry, of Ansonia. The rolls are being made by the A. Garrison Foundry Company, of Pittsburgh, Pa. The two heating furnaces for the hot rolling are located in the L in which the rod train is placed. The capacity of the plant fully employed is rated at about 6,000,000 pounds of sheets and rods and about 1,500,000 pounds of wire. The company are building a dock on the river, and are dredging a channel, which will enable them to handle the necessary coal readily. A well is being sunk into which river water for the condensers will be conducted.

The plant was located at Bridgeport, after mature reflection over the possible advantages offered—for instance, by the cheap fuel of the West. It was not placed in the Naugatuck Valley chiefly because of the additional cost of coal. At Bridgeport the plant is close to the great metal manufacturing points in Connecticut, and there is little trouble in drawing from the population of skilled workmen the necessary supply of labor. A departure in the direction of methodical work will be the establishment of a chemical and mechanical laboratory.

The Aluminium Brass and Bronze Company have adopted the use of Cowles alloys after thorough study of their characteristics, being convinced of their greater strength and their resistance to corrosion. A series of very interesting tests has been made with silicon bronze wire for electrical purposes. A wire 0.0632 inch in diameter, weighing 64 pounds to the mile, and a resistance of 23.8 ohms to the mile, showed a tensile strength of 262 pounds and an elongation of 2.4 per cent., and underwent from 110 to 126 twists. The principal advantage of such silicon bronze wire is that there is less trouble in handling it and that the number of poles, one of the great items of cost, is greatly reduced. It is stated that while the number of poles for hard drawn copper wire ranges between 36 and 43 per mile, the poles carrying silicon wire may be placed 1000 feet apart.

The following analyses of ores from the mines of the Bluffton (Ala.) Land, Ore and Furnace Company were made by J. H. Pratt, of Birmingham, Ala.:

	Clay Bank.	High Bluff.	Roland Bank.	Hickory Tree Bank.	Cleveland-Miliken Bank.
Ferric oxide.....	78.49	79.97	84.16	83.20	78.71
Silica and sand....	5.52	6.75	2.86	2.69	4.97
Phosphoric acid....	1.19	2.34	2.31	2.06	2.77
Water combined..	10.74	11.02	11.15	10.95	10.80
Moisture at 100° C.	0.99	0.32	0.65	0.60	0.60
Metallic iron.....	54.88	55.98	58.91	58.24	55.10
Phosphorus.....	0.52	1.02	1.01	0.90	1.21

The principal development thus far has been made at the Clay Bank.

Mr. G. L. Walker, of Plymouth Foundry Company, Plymouth, Mass., has recently returned from a two-months' trip to the Pacific Coast. Mr. Walker combined business and pleasure and enjoyed a satisfactory amount of both.

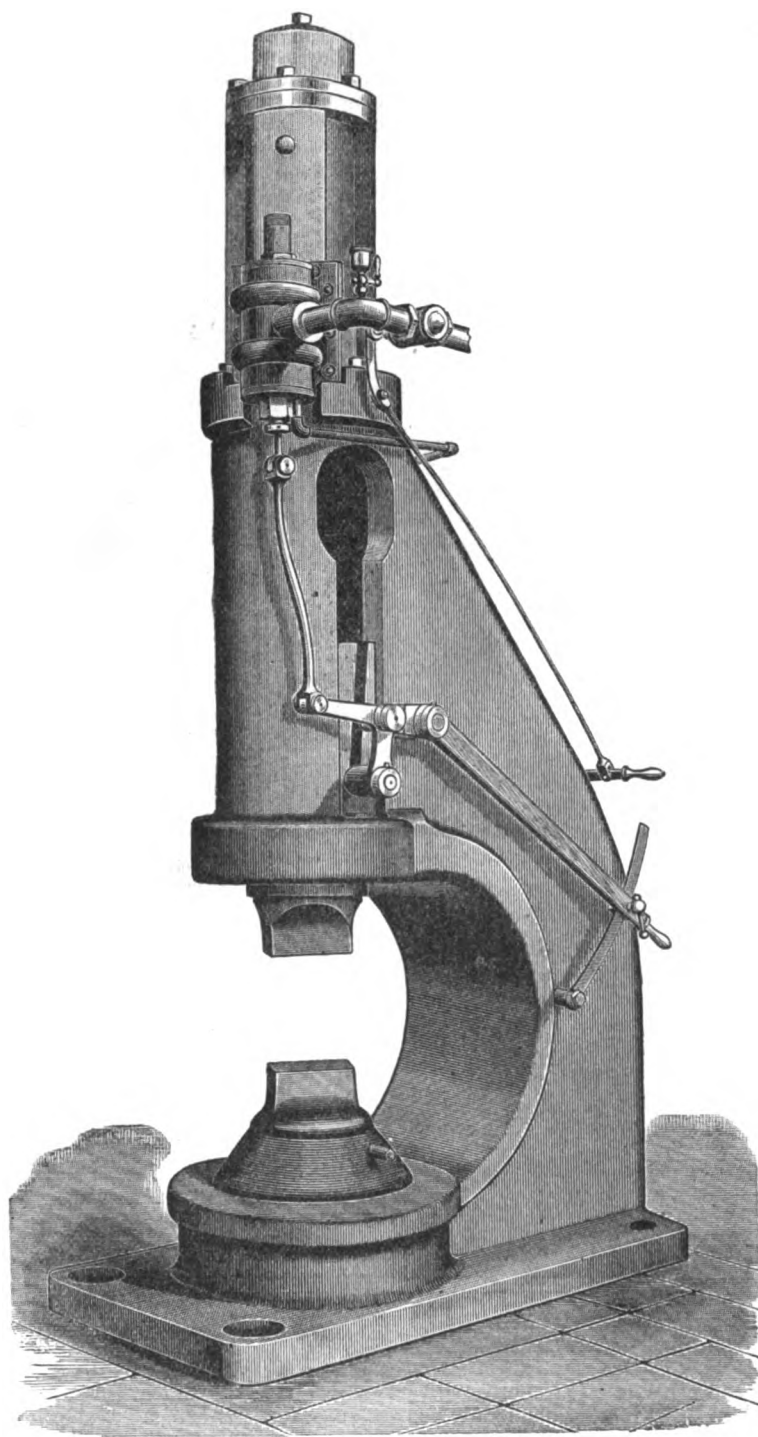
A jury at Greensburg, Pa., gave a verdict of \$4798 against Carnegie Brothers, the amount of damage done to a fruit farm by smoke caused by burning coke on lands adjacent. Judge Hunter ruled that inasmuch as the coal used for the manufacture of said coke was not mined on the premises, but shipped there from other localities, the company, he believed, was liable for any damage done the plaintiff's property.

Automatic Steam Hammer.

In the steam hammer here illustrated the frame, or housing, where the anvil passes through is bored true to receive the top of the anvil, which is turned off to fit. The advantage gained by having the ram and anvil in line will be readily seen; all that is required in making the dies for

side. The makers of this hammer, the Knoxville Car Wheel Company, of Knoxville, Tenn., in addition to the special dies can also furnish dies for making railroad coupling pins.

The Atkinson Car Spring Works, of Chicago, are in no way disconcerted at the suits recently brought against them by



GUILD'S AUTOMATIC STEAM HAMMER.

special work is to make them true to the shank of the die, when they will come exactly in line. The ordinary die can also be turned around to any angle desired. The valve is a simple piston having two packing rings. The steam-chest is lined with a brass bushing formed with a series of holes drilled to correspond with the annular recess in the steam-chest. This construction obviates the necessity of projecting the post and gives a free passage for the steam. The valve is balanced and very easy to handle, while it may be easily got at, as all its connections are on the out-

residents of the neighborhood for maintaining a nuisance. President F. M. Atkinson states that these suits have been instigated by parties having ulterior motives, which will be demonstrated in due time. The condition of the works has been investigated by the Board of Health, in accordance with the complaints made, and the officers found that fish oil was not being used for tempering, and that care was taken by the company to avoid the creation of disagreeable odors by having the tanks covered with exhaust fans drawing off the fumes. Gas furnaces are used

for heating the steel, so that but little smoke is made by the works. The hammers complained of are very light, the heaviest being but 80 pounds, so that not much jarring could be done by them. The absurdity of the charges brought against these works is shown by the fact that they are located in a district almost wholly given up to manufacturing. They are surrounded by malt houses, distilleries, tanneries, rolling mills, &c., all making more or less smoke, many yielding stenches of the most disagreeable character, and some being exceedingly noisy. The suits entered have been appealed, steps have been taken to check further prosecutions, the company's operations have not been interfered with, and the pecuniary consequences have been insignificant. This statement is due to the company in view of the sensational reports which have been published concerning them.

Locked Wire Rope.

E. G. Spilsbury, managing director of the Trenton Iron Company, Trenton, N. J., presented at the New York meeting

that they may be readily designed to meet the requirements of every particular case and that the flexibility may be increased by the method adopted in laying up the rope. The total tensile strength of the locked rope represents a higher percentage of the aggregate tensile strength of the individual wires. The weight per foot for the same size is of course greater than that of the ordinary wire rope, being about 50 per cent. more. It is pointed out, however, that the greater bearing power will allow of a smaller size of rope. The cost of the locked rope is about double that of the ordinary stranded rope, but it is claimed that increased life compensates for it. Some of the data gathered during years of use in English collieries point to this conclusion.

On the score of safety the fact is emphasized that when one wire breaks it is not loose, but being locked by its neighbors, merely tends to create an irregularity at the socket and gives timely warning of its condition. On long ropes the lessened weight through greater strength is an important consideration. In mines it lessens the dead-weight and allows of going to greater depth without heavier engines, or

cles they make the partly-finished product, carrying it, with the aid of a good deal of special machinery, to the point desired by their customers. Thus we are informed that they make the axle boxes for childrens' carriage axles by the million. They produce also twisted and plain copper lightning-rod tubes. They report that in a number of small articles the high price of copper during the past year has led to the substitution of cold-rolled steel for it, some of the brass and copper manufacturers themselves placing considerable orders for some specialties. Some of the specimens shown exhibit a capacity for undergoing torture which few familiar with steel would credit the metal with.

Company Stores in Illinois.

The following bill, directed against "company stores," has been introduced in the Illinois Legislature, and is making progress toward enactment into a law:

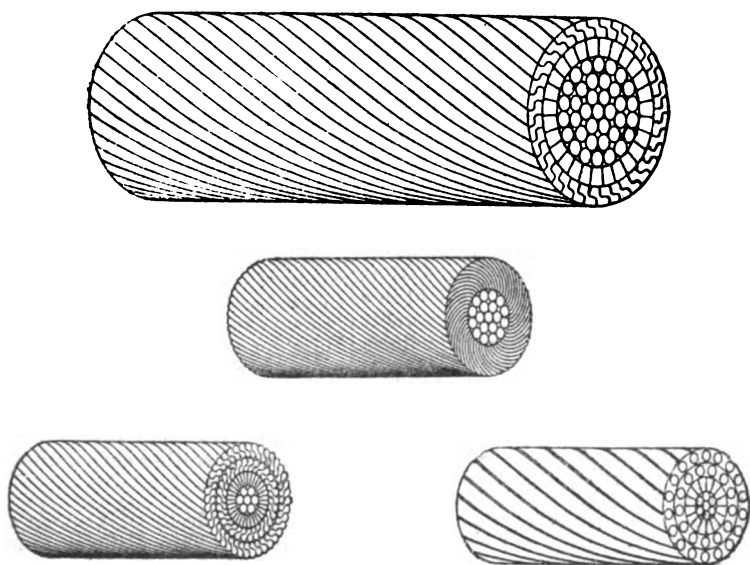
"That it shall be unlawful for any person, company, corporation or association now engaged or hereafter to be engaged in any mining or manufacturing business in this State to engage in, or be interested in, directly or indirectly, the keeping of a truck store or controlling of any store, shop or scheme for the furnishing of supplies, tools, clothing, provisions or groceries to his, its or their employees while so engaged in mining or manufacturing.

"Every person, company, corporation or association found guilty of violating Section 1 of this act, either by himself, its or their agents, servants or employees, or partners, shall be guilty of a misdemeanor for each and every day such business is done in violation of said section, and on conviction will be liable to a fine for each offense of not less than \$50 nor more than \$200, to be recovered in the name of the people for the use of the school fund, and any person having knowledge of the fact that said section has been violated may make complaint and cause summons or warrant to be issued, and if conviction follows and fine be paid such person shall be entitled to one-half the fine when collected, to be paid by order of court to such person.

"It shall be unlawful for any person, company, corporation or association, employing workmen in this State, to make deductions from the wages of his, its or their workmen, except for lawful money, check or draft actually advanced, without discount, and except such sums as may be lawfully garnished in the hands of such employer by process of a court, and except such sum as may be agreed upon between employer and employee which may be deducted for hospital or relief fund for sick or injured employees. Any deductions made from the wages of any workman in this State, except as provided in Section 3 of this act, may be recovered in any appropriate action before any court of competent jurisdiction, together with such reasonable attorneys' fees as the court in its discretion shall think proper, and no offset or counterclaim of any kind shall be allowed in such action or proceeding.

"All attempts to evade or avoid the provisions of this act by contract or otherwise shall be deemed a violation thereof, and for every violation, in addition to the civil remedy provided for in Section 4, there shall, on conviction, be a fine imposed of not less than \$50 nor more than \$200 for each offense. Nothing in this act shall be so construed as to include the business of farmers or farm laborers or servants."

Senator Farwell, of Illinois, is one of a number of capitalists, British and American, who have purchased a tract of 200,000 acres in Durango, Mexico, for stock-breeding purposes.



SPECIMENS OF LOCKED WIRE ROPE.

of the American Institute of Mining Engineers a paper on the locked wire rope invented by an English firm—George Elliott & Co.—and introduced into this country by the Trenton Iron Company. In ordinary wire rope, flexibility can only be secured by making the number of wires to the strand large and by choosing a small gauge of wire. The result is that the wear of the rope is limited practically to less than one-half of the diameter of the individual wire. The outside wires—those which come into contact with the wearing surfaces—are those which determine its life. A serious source of wear is that the rope running over a sheave is apt to cause the formation on its face of diagonal grooves. When the rope does not happen to raise up to match these grooves, it slips into them, causing additional abrasion. In ordinary ropes, too, a broken wire in the strand is apt to curl up. With cable traction rope, there is danger that it clogs the grip of the cable rods.

The Elliott locked rope differs in its construction from the ordinary stranded rope in that it is composed of wires drawn to special section, as shown in the accompanying engravings, the section being such that the individual wires are locked by their neighbors. Our engravings indicate a few of the many combinations possible under this system. It will be noted

results in a saving of power. Another point of consequence in some mining operations is that there is no tendency to twist in the shafts. Until now the ends of the locked rope have been united by brazing, the ordinary methods of splicing being of course out of the question. It is the intention of the Trenton Iron Company to use electric welding, however. Some tests made with that process have given very encouraging results.

The Wilmot & Hobbs Mfg. Company, of Bridgeport, Conn., manufacturers of cold-rolled steel, have more than doubled their capacity during the past two years. The bulk of their product is steel in coils or strips, a form particularly suitable for automatic machinery in subsequent operations. They produce this steel in the range of No. 5 and 6 gauge, down to Nos. 33 and 34, the maximum width being 8 inches. The steel is used for a wide range of articles, among them keys, sewing-machine attachments, parts of clock movements and locks. They produce metal for penholder tips, stove trimmings, partly finished blanks for the watch-cases of anti-magnetic shields, steel, electric, toy and sleigh bells, caster tubes, bicycle pedal tubes, music-stand tubes, butted or lock-seamed tubes, &c. In all these arti-

THE WEEK.

St. Paul newspapers expatiate upon the advantages offered by that city as a manufacturing center. They are apprehensive that Minneapolis and Duluth may attract industries more strongly, especially as the former has decided to raise \$400,000 for the purpose of establishing a gas and water pipe manufactory in competition with Louisville, Cincinnati and St. Louis. The *Dispatch* says: "We ought to roll our own construction, merchant, sheet and plate irons, light rail sections, make our own chains and nails, supply all our neighbors with pressed and glazed brick and tiles, have a fair share of the railroad car making profits, build engines, ship tow-ropes and twines all over the nation made from wild weeds, grind our natural ochers into paint, secure the supply of tin from the Black Hills and sell the millionaire packers their tin plates, make paper from Mississippi rushes, and spin linen from Dakota golden rod and sunflowers. These are all possibilities—strange as it may seem—which St. Paul men will do well to consider."

The steamship City of New York is fulfilling the prediction of her builders, now that her machinery is running more smoothly. She left Queenstown March 7, and arrived at the bar at 8.30 a.m., 14th inst., beating her best previous record. Her time was 6 days, 14 hours and 7 minutes.

The Chilians, after running a line of steamships for several years between Valparaiso and Panama, are now practically independent of English influence on that coast, so far as concerns the foreign trade. What is known as the South American Steamship Company have a fleet of English-built steamers, all flying the Chilean ensign, with two more in process of construction, and have recently acquired certain exclusive rights from the Government, together with a subsidy that will amount to between \$100,000 and \$150,000 a year, in consideration of which the company are to keep up a regular fortnightly service between Valparaiso and Panama without transshipment of passengers or freight. This will insure a regular line of transportation between the United States and the countries of South America, in connection with the Pacific Mail Steamship Company and the Panama Railway; and since the new company have materially reduced the rates of freight and passage on their route, and are catering especially for the American trade, there is every reason to expect a present development of the commerce between the countries.

The Anchor line of steamers has purchased the Kelsey property in Brooklyn for \$510,000. The property includes three piers and slips, between 500 and 600 feet of water front and 4 or 5 acres of ground, a grain elevator with 750,000 bushels capacity, and several general storage warehouses. Extensive improvements will be made.

A formidable submarine ram has been invented by William R. Cavett, foreman of the Porter Machine Company, in Pittsburgh. The boat will be flush with the water-line, and will have a turtle-shaped back, covered with heavy steel plates. In the forward part of the vessel will be a heavy cylinder, similar to those used on engines. It will be about 15 feet long and will contain a piston-rod 12 or 15 inches in diameter. This piston will extend through the bow of the boat and will be the ram proper. It will be propelled by a force of steam amounting to from 50 to 150 tons, sufficient to pierce the side of the heaviest ironclad at one blow. The business end of the ram will be made cup-shaped, so that the sharp edges will take hold anywhere they happen to strike. Mr.

Cavett promises a speed of 20 to 22 knots an hour. He says that he has computed the striking force of the piston, and estimates that, with a 60-ton force, it will knock a plate from the heaviest man-of-war afloat. Only six men will be needed on board the boat, and the only vulnerable place on the craft will be a small glass-covered aperture about a foot square for the wheelman. So small and compact will be the wicked little vessel that it can be carried on board a man-of-war and can be used in encounters at sea as well as for harbor defense.

The commissioners nominated for the Samoan conference at Berlin are John A. Kasson, William Walter Phelps and George H. Bates. Mr. Bates is about 40 years of age, a Democrat and a warm friend of ex-Secretary Bayard's. He is a son of the ex-Chancellor of Delaware and a lawyer of high standing in Wilmington. Mr. Bates was appointed by Secretary Bayard as special commissioner to investigate our Samoan relations, and made a long and exhaustive report to the Department on December 10, 1886. William Walter Phelps and John A. Kasson have acquired an intimate knowledge of diplomacy through service as United States Ministers in Europe, Mr. Phelps having been Minister to Austria in 1881, and Mr. Kasson Minister to Austria in 1877 and to Germany in 1884.

Mexican railroads are shown by an official report to have been costly in construction, owing to engineering difficulties, but they have contributed greatly to the prosperity of the country by making its resources available and opening new districts for colonization. The oldest line in Mexico, the Mexican Railway, connects the capital city with Vera Cruz, and is some 300 miles in length, and is laid in a manner that would compare favorably with any railroad in England for finish and solidity of construction. The line with greatest mileage is the Mexican National Railway, extending about 2000 miles, but its usefulness is greatly impaired by the narrow gauge which it has adopted, thus putting it practically out of touch with other systems. The next in importance is the Mexican Central Railway, connecting Paso del Norte with Mexico, with a main line of 1223 miles in length. Like the other lines, it is well constructed. The other railways are the Mexican International Railway, open from El Paso to Torreon, a distance of 517 miles, but with easier gradients than the lines previously named; the Inter-Oceanic Railway, intended to connect the Atlantic and Pacific through the capital, of which 240 miles were open when the report was compiled, and the Mexican Southern Railway, with small progress made up to the present time.

Harry Fraser Worthington died in this city last week, aged 44. He was the eldest son of the late Henry R. Worthington, inventor of the Worthington pumps. He had been in business, and 12 years ago was a member of the New Jersey Legislature, but for several years he had been an invalid.

An extensive purchase of lands on the Jersey flats, about a mile distant from the Statue of Liberty, has just been completed by the Pennsylvania Railroad Company for dock and wharf purposes. This will give the company a shore line of 3660 feet. The plans for improvement comprise a wall at the exterior line, open for the passage of ships to a basin within. The openings will be at a dozen points, the sections to be connected by trestlework with warehouses and depots on the solid filling. By this means a vast system of basins, piers and connecting roads will be formed, with facilities for commerce and passenger traffic. The railroad company will begin

filling in with rock and refuse. That work alone will take several years, and the estimated cost is \$9,000,000. The area to be given over to commerce is larger than that of the entire city of Bayonne. In addition to the railroad taking its freight business to the new terminus, it is said that the steamship lines now controlled by the company will have their piers there, and that two new lines to Europe will be established.

Buffalo papers say there is good authority for stating that the Canadian Pacific Railroad will be extended to that city from Toronto, by way of Niagara Falls, and that the company will probably build an independent bridge.

The New York Chamber of Commerce formally approved resolutions supporting the plan proposed by the Dock Commissioners "to afford a reasonable and practical mode of giving a certain, positive, additional accommodation" to the shipping interests of New York "without any injury to the channels or to existing conditions and facilities."

A water-power company at Buffalo wishes to obtain a charter with the object of creating a great water power by tunneling through to the bottom of the Niagara gorge, and by means of an open ditch supplying manufacturing establishments between Buffalo and Suspension Bridge.

A rapid transit bill, prepared by Mayor Grant, has been introduced in the New York Legislature. Its aim is to provide a speedy, durable and safe method of transportation between the upper and lower parts of the city, and to attain this end as speedily as possible after the plan has had popular approval. To sum up, the bill enables the city, through its own agents, to create the franchise, makes it public property in the hands of the city, and provides for private agencies in its operation only after the city has approved of the road which is to be built and operated, its routes, plans for its construction, and the terms and conditions of the charter under which the operating corporation is to derive its power.

Since the death of Captain Eads the Tehuantepec Ship Railway Company has been under the direction of Col. James B. Andrews, the associate of Eads in his great works at the South Pass Jetties and the St. Louis Bridge. Its recent president was Secretary Windom, the present Secretary of the Treasury, who was elected soon after the company's organization. The New Orleans *Times-Democrat* learns through Capt. E. L. Cortell that the Mexican Government has made another proposition to hasten progress on the work. The Government promises to guarantee 5 per cent. interest on the \$60,000,000 worth of bonds, the sum considered requisite for the construction of the railway, in case the company's earnings should not be as much as 5 per cent.; or, if this interest falls below \$3,000,000 a year, the Mexican Government proposes and promises to make up the entire amount of that deficit to the stockholders.

The attempt to restore the 3-mill tax on manufacturing corporations in Pennsylvania was defeated on a test vote in the Legislature.

John Huntington, of the firm of McIntosh, Huntington & Co., of Cleveland, Ohio, who was formerly extensively engaged in the roofing business, has given the munificent sum of \$200,000 to institutions in that city. He made a number of valuable inventions and obtained patents for improvements in furnaces, methods of refining and machinery for manufacturing barrels. When the Standard Oil Company was formed by the combination of a number of companies, Mr. Huntington

and his inventions were taken into the new organization. It was here that he laid the foundation for his present fortune. He is still interested in the Standard, has large vessel interests, is the vice president of the Cleveland Stone Company, and has other property which yields him a handsome revenue.

The annual report of the State Superintendent of the Banking Department relative to savings banks and trust companies, just transmitted to the Legislature, contains some interesting facts in relation to the savings of the people. The report only includes State institutions. The increase in the number of depositors and the amount of deposits since 1860 has been surprising. Then New York had 273,697 depositors and only \$58,178,160 due depositors, an average amount of \$208.91 for each account. Now there are 1,362,852 depositors, with a total of \$523,677,515 due depositors, and an average amount of \$384.25 for each account. The population of the State, according to the last census, was 5,082,871, and allowing for the increase, it is safe to say that one-quarter of the entire population has a bank account in these State banks. One in four of the population

Speaker Graves has introduced a resolution in the Minnesota Legislature declaring that the United States should compete for the commerce of the world; that money should be appropriated from the Federal Treasury for the construction and operation of steamship lines from New York to European ports and to South American ports; also from San Francisco and Tacoma to Japan and Australia. As England has already entered into engagements with the Canadian Pacific Railroad Company for the maintenance of a steamship line to Japan and Australia and has already established steamship communication with all commercial countries, the action here advised comes rather late, but it is a wholesome sign when the West begins to wake up to the necessity of extending our foreign markets.

The elevated railroads in this city, which paid nothing for the right of way before obtaining their charters, are now doing something in that direction. Last week the largest judgment yet awarded in any single action against the Manhattan Company was given by Judge Ingraham in the Supreme Court in favor of the Sixth Avenue Surface Company. It appeared in evidence that, with one or two exceptions, there has not really been a first-class apartment house erected on Sixth avenue from Forty-second to Fifty-ninth street since the building of the elevated railroad, and the plaintiff's property had suffered more than any other. The awards aggregate \$95,000. The usual injunction accompanies the decision, forbidding the operation of the road after 30 days unless the judgment is satisfied.

Cordage manufacturers in New York City deny that a "twine corner" is in contemplation, but contend that binder twine this year may be 25 per cent. higher than last year, owing to the demand outrunning the supply and the inability of manufacturers to control the raw material. The effect on the farmer is to compel him to pay about \$6 more this year for say 150 pounds of twine, enough to bind 100 acres of grain. A dispatch from Fargo, Dak., states that it is proposed to establish a large twine factory there and manufacture flax fiber into twine. Last year there were 329,288 acres planted to flax in the Territory.

The appointment of Abraham D. Hazen to be Third Assistant Postmaster-General gives much satisfaction. To Mr. Hazen, while formerly in that position, is due the credit for the extension of the registry

system to parcels of merchandise, which has proved so great a convenience to the public during the past 11 years, and has brought about a substantial reduction of rates by the express companies.

A freight contract between the Northwestern Transportation Company, better known as the Anchor line, on Lake Erie, and the Baltimore and Ohio Railroad will almost double the lake traffic at Erie during the coming season. Three iron steamers have been added to the fleet.

The lake shipyards are all busy, encouraged by the profitable rates of freight realized by vessels in the lake traffic. At Detroit the Dry Dock Company alone are employing nearly 1600 men, and have in course of construction nearly a dozen steamers, valued at \$2,000,000. The steel steamer City of Detroit is nearing completion. Secretary McVittie, of the Dry Dock Company, says the aggregate tonnage which will be placed on the lakes this season will approximate 100,000 tons.

Collector Magone, of this port, expresses himself strongly in reference to contract labor, claiming that the present law designed to exclude immigrants under previous contracts is inoperative, that the criminal classes, convicts and anarchists have a better chance of landing without objection than an honest man. He would have every immigrant medically examined to determine his sanity, and exclude all who have been convicted of a crime.

The annual rush to Europe by the steamship lines from New York promises to be larger this season than ever before, mainly on account of the attractions of the Paris exhibition. The active season will begin earlier than usual, as nearly all the berth-room on the various steamers from about the middle of April to the middle of July has already been engaged. Some of the lines will run as many as three steamships a week, calling into the service a considerable fleet of extra steamers. On the line to Antwerp a large number are booking through to Paris, as the run from Antwerp is only six and a half hours.

The increasing indebtedness of Canada in no way dampens the ardor of those who advocate grand schemes of internal improvement. Not long ago a scheme for a ship railway somewhere down in the Maritime Provinces was approved, regardless of cost, and the Chamber of Commerce at Toronto have just adopted a report favoring the construction of a ship railway from Georgian Bay to that city, at a cost of \$12,000,000.

The Paterson, N. J., silk manufacturers are rushed with orders. Broad goods are increasing in favor.

The coastwise transportation business this season has been very good, both by the land and water routes. The orange trade, now drawing to a close, was heavy beyond precedent. Strawberries are backward.

Quantities of structural iron are being distributed on the line of the Pennsylvania Railroad in Jersey City for the elevation of the tracks.

The Quaker City cold storage warehouse about to be erected in Philadelphia, it is claimed, will be the largest of its kind in the United States. The interiors of the brick walls are to be lined with three thicknesses of wood, between which are to be several thicknesses of the "Kelly" insulating cell paper. Each floor will be divided into 15 compartments. All of the windows in the compartments have four or five glazed sashes in each, and there will be five elevators, each provided with an air lock.

There was but one proposal received by the Navy Department for supplying the machinery of the armored cruiser Maine,

now building at the New York Navy Yard. This bid was made by the Quintard Iron Company, of New York (N. F. Palmer, Jr., & Co.), and amounted to \$735,000.

Business men in Philadelphia are restless under the steady decline for several years past of the commerce at that port. The grain export trade of Philadelphia has declined from nearly 31,000,000 bushels in 1879 to 1,809,215 bushels in 1888. The petroleum export of Philadelphia reached its highest point in 1887—3,227,422 barrels—which was nearly one-half of the amount exported from New York for that year. But it declined in 1888 to 2,657,743 barrels. In other respects the loss of trade with foreign ports is too apparent to be concealed. Several commercial bodies are attempting to devise a remedy. A committee of the Board of Trade is pressing its inquiries in every direction. *Per contra*, it is said that while there has been a great falling off of late in the exports of two great staples—grain and petroleum—this loss has more than been made good by increased imports, so that, upon the whole, the commerce of the port is on the upward grade.

The new Secretary of the Navy, Gen. Benj. F. Tracy, in a speech delivered at a club dinner in Brooklyn on Saturday night, spoke of the necessity for continued naval enlargement. He said: "What has been transpiring on the Isthmus, in South America and in the Pacific has impressed upon the American people the fact that we need and must have a navy—a navy that can cope with any nation in the world—not to make war, but that we may be able to maintain peace with dignity and honor. That work was begun some six years ago, and the foundations have been laid by my predecessors broad and deep. Fortunate shall I be if I can succeed in erecting the superstructure on the foundations they have laid. Although we are late in commencing the construction of a navy, such has been the vast improvement in the building of armored war ships in the last few years that we have lost nothing by delay. There has been more progress in this direction in the last six years than in the 25 years preceding." As for himself, in the administration of the navy he would indulge in no rash promises as to what he hoped to accomplish.

Agriculture and manufactures in South Carolina are in a prosperous condition, constantly attracting a larger capital. The Charleston *Courier and News* is authority for the statement that while in 1877 the value of the principal crops was \$28,186,080, in 1885 the value had risen to \$41,081,195, an increase approaching \$13,000,000, and in 1888 the aggregate reached \$44,135,000. While in agriculture the total value of products now falls materially below that of 1860, there is in manufactures a large and significant gain over the ante-war period. The capital now employed in all manufactures is three times that of 1860, and the value of the products two and a half times what it was then. In 1880 manufactures contributed 23 per cent. of the value of the entire industrial product of the State; in 1887 the ratio derived from that source was 31½ per cent., and doubt is expressed whether any other State in the Union can show an increase equal to this. The rapid growth of cotton manufactures seems to indicate that this form of industry is particularly adapted to the natural conditions of the State. The number of spindles has increased from 35,000 in 1870 to 82,334 in 1880, and for the year just expired it is officially estimated at 250,000 spindles. The value of the products of the forests is increasing still more rapidly.

MANUFACTURING.

Iron and Steel.

On Monday, the 18th inst., a 10 per cent. reduction in the wages of the employees of the Catasauqua Mfg. Company, of Catasauqua, Pa., went into effect. The reduction affected about 600 hands.

Capitalists of Youngstown, Ohio, have about concluded arrangements for the building of an extensive bridge works in the suburbs of Hazleton, on or near the site of the Morse Bridge Works, which were destroyed by fire. The organization will be known as the Youngstown Bridge Company, with a capital stock of \$100,000, all of which has been subscribed. Application has been made for a charter, the incorporators being B. F. Boyd, Hamilton Harris, Robert Hunter, L. E. Cochran and John Neilson. The company expect to be in operation in three months and employ 100 men.

S. S. Hartranft, a son of ex-Governor Hartranft, of Pennsylvania, has been placed in charge of the blast furnaces of Brown, Bonnell & Co., at Youngstown, Ohio. Mr. Hartranft was recently furnace manager for the Brier Hill Iron and Coal Company, also at Youngstown.

The small Russia sheet-iron works, built near Freeport, Armstrong County, Pa., in 1887, are for sale. The works were intended to produce Russia sheet iron from purchased sheets. The principal piece of machinery is a Morgan steam hammer.

The Iowa Barb Wire Company, of Al-lentown, Pa., who now employ 250 hands, are about to build a Garrett mill for rolling rods from 4-inch steel billets. The new mill will be 160 x 210 feet, with a capacity to roll from 30,000 to 40,000 tons of rods per year.

The South Birmingham Coal and Coke Company have been organized at Salem, Roanoke County, Va., with a capital of \$1,000,000. Charles G. Emery, of New York, is one of the directors. The company will erect 100 coke ovens and a furnace at once.

It is reported that the Centre Iron Company, of Bellefonte, Pa., have increased their capital stock to \$150,000 and are considering the advisability of adding a rolling mill to the present plant.

A company is being organized in Philadelphia to operate the Gem Furnace, at Mines Station, on the Shenandoah Valley Railroad, which was sold out by the sheriff a few weeks ago. It was bought in by D. W. Flicker, superintendent of the railroad company, acting for Philadelphia capitalists, who are now forming the company. Applications have been received already for all the stock that will be issued.

The two stacks of the Brier Hill Iron and Coal Company, at Youngstown, Ohio, are in blast, with good prospects of continuing in that condition.

The new steel rail plant of the Allegheny Bessemer Steel Company, at Duquesne, Pa., is now in successful operation. The company have adopted the process of rolling rails without reheating between the blowing-mill and the finishing rolls. The rail is taken out of the pit, taken to the blowing-mill, and from that on to the finishing rolls without being reheated. It is stated that the company have sufficient orders on their books to keep their plant in constant operation for three months.

The failure was announced last week of the Lewisburg Nail Works, at Lewisburg, Pa. The company were organized about three years ago as a stock company, but about a year ago were reorganized as an incorporated company with a capital stock

of \$50,000. John F. Duncan is the president and Truman H. Purdy, of Sunbury, treasurer. The company also ran a store in connection with the works and employed 100 hands. The past year they have lost between \$5000 and \$10,000 in bad debts, and the failure of the Reading Iron Works, one of their largest debtors, was the immediate cause of the failure. On the afternoon of the 12th inst. the sheriff levied on all the property of the works on executions issued on judgments confessed on the company's paper, amounting to \$32,000. Most of the indorsers are the directors of the company, and they took this step to save themselves as far as possible. There is also a mortgage of \$35,000 on the plant. The works were shut down. It is probable that the affairs of the old concern will be wound up and that a new company will be formed.

It is reported that Irondale Furnace, Preston County, W. Va., will blow out about April 1, and will remain closed for an indefinite period. The cause is said to be a want of ore, the new mines opened by the company having proved unsatisfactory.

The nail factory of P. L. Kimberly & Co., Limited, at Sharon, Pa., which has been idle for the past three months, was put in operation on Monday, the 11th inst. The factory contains 40 nail machines.

Some extensive improvements will soon be commenced at the Edgar Thomson Steel Works, of Carnegie Brothers & Co., Limited, at Braddock, Pa. A new 10-ton converter will be put in, in addition to those already in use. A telegraph machine will be put up to transfer the ingots from the converting department to the blooming mill. Several other new devices will be introduced, which will permit of considerable saving in skilled labor. New labor-saving machinery of the latest pattern will be placed in the blooming mill, which will greatly increase the capacity of the works. A saw that will cut three rails per minute will be added. The entire plant will be overhauled, and wherever improvements can be made it is the intention of the firm to make them.

The rolling mill of the Kittanning Iron Company, Limited, of Kittanning, Pa., which has been idle for about two months, resumed operations on Monday, the 18th inst. Muck iron is the principal product of the plant, the greater part of which is shipped to Pittsburgh.

The entire plant of the Bellefonte Iron and Nail Company, Limited, at Bellefonte, Pa., resumed operations in full on Monday, the 18th inst., after an idleness in the various departments ranging from one to three weeks.

J. B. Carr & Co., of Troy, N. Y., are making two suits of 2½-inch chain, 230 fathoms each, for two of the largest ships ever built at Bath, Me. These chains are made in two shots for each vessel—i. e., 100 fathoms and 120 fathoms each, thereby doing away with any shackle except the anchor shackle. The 100 fathom shot weighs 30,000 pounds and the 120 shot 38,000 pounds. The 100 fathom is B. B. and the 120 fathom shot is B. B. B. chain.

The Moran Bolt and Nut Works, in St. Louis, were destroyed by fire on the 13th inst. The stock was valued at \$30,000 and was totally destroyed. The machinery was valued at \$25,000 and will be damaged to the extent of \$20,000. Mr. Moran places the damages to the buildings at \$10,000. There was no fire about the place, and how the flames so completely originated is mysterious. Fifty hands were employed in all, and 30 machines were used.

Robert Bentley, general manager of the Ohio Iron and Steel Company, at Lowellville, Ohio, furnishes the following com-

parative analyses of some well-known brands of imported Scotch and the No. 1 Ohio Scotch foundry iron:

	No. 1 Ohio Scotch.	Coltness.	Imported Scotch Glengarnock.
Metallie iron.....	91.52	90.26	90.70
Silicon.....	3.12	3.30	2.83
Manganese.....	1.41	1.77	2.13
Graphitic carbon.....	3.24	3.27	2.68
Combined carbon.....	0.08	0.60	0.85
Phosphorus.....	0.46	0.44	0.54
Sulphur.....	0.02	0.04	0.04

It is reported that the Pottstown Iron Company, of Pottstown, Pa., have decided to have their blast furnace rebuilt this spring and that the contract has already been given out. The contract consists of four hot stoves 19 feet in diameter and 65 feet high, blast-pipe, receivers, and a stack 14 feet in diameter by 154 feet high.

The New Castle Wire Nail Company, of New Castle, Pa., will commence the erection of an extensive rod mill during the present month. It will be built adjacent to the nail factory. An order for a 2300 horse-power engine has been placed with the Southwark Foundry and Machine Company, of Philadelphia, while the A. Garrison Foundry Company, of Pittsburgh, have been given the contract for four trains of rolls.

Machinery.

The Ranken & Fritsch Foundry and Machine Company, of St. Louis, have recently secured a contract for an entire outfit of machinery for a new plate glass works to be built in Pennsylvania. The contract is a large one, and will require from 25 to 30 cars for its shipment.

Among the recent sales made by A. B. Bowman, of St. Louis, dealer in machinery and machinists' tools, are: One large engine to operate an electric light plant at Portia, Ark.; one to run a coal screen at Josslin, Mo.; one to Eureka Springs, Ark., and one to Mexico to be used in a large flour mill. Three large Vulcan hammers were sold in St. Louis, and a complete machine shop outfit at Topeka, Kan., consisting of lathes, planers, engines and boiler, drill press and small tools for machine and blacksmith shop. A heavy order was also placed with Mr. Bowman by the Missouri Pacific Railroad.

Curtis & Curtis, of Bridgeport, Conn., will have three pipe-threading machines at the Paris Exposition; one working right and left from ½ to 2 inches, another 2½ to 4 inches, and the third 4 to 6 inches. These machines will be employed on the piping for the American section and will afterward form a part of the exhibit.

The Universal Radial Drill Company, Cincinnati, Ohio, are distributing to their friends in the trade a monthly calendar sheet directing attention to their manufactures. The March calendar, which is before us, presents an engraving of their radial drill Nos. 2, 1 and 0, while the border is embellished with a picture of the old-time Egyptian drill operated by a bowstring. On the back of the card is a list of the tools they make and a large illustration of their works.

A. L. Ide & Son have received a 10-year contract for lighting the streets of Springfield, Ill., with arc lights of 2000 candle-power, at \$137 per year for each light. In connection with this contract they have agreed to furnish incandescent lights for commercial use at a price not to exceed the cost of gas of equal illuminating power at \$1.50 per 1000 feet. Also to furnish current for electric motors from ½ to 10 horse-power within 2000 feet of their station at a cost not to exceed \$100 per year for each horse-power for ten hours' use per day. They will erect a new station of sufficient size to enable them to operate the street railways, of which Mr. Ide is president, by electricity. The same firm

have also received an order from the Union Iron Works, of San Francisco, to deliver within three weeks two Ide engines of 150 horse-power each and one of 100 horse-power. They have received orders for 10 engines in the last two weeks, all to be delivered within 30 days, which necessitates running their works nights. Their new works are in full operation, and are turning out from two to three engines per week.

A battery of boilers exploded at the West Point Boiler Works, in Pittsburgh, last Thursday, causing the death of five men and completely wrecking the building.

The Pittsburgh Locomotive Works during the past year have turned out 95 new locomotives and repaired 14. It is the intention of the firm to gradually increase the output to about 250 engines a year. Each year finds a new building added to the already large works in Allegheny, and a member of the firm remarks that during the coming year several more will be added.

A company has been organized at Chicago under the name of the North-Western Street Railway Gas Motor Company, to manufacture street car motors and motors for manufacturing and domestic purposes and for furnishing propelling power. The capital is \$5,000,000, and the incorporators are Francis A. Bates, Edward T. Getchell, and Jefferson Hodgkins.

Midgley & Emerson, of Beaver Falls, Pa., manufacturers of wire belting, have the contract to furnish the main belt to run the machinery for the American exhibit at the Paris Exposition to be held during the coming summer. It will be 20 inches wide and 60 feet long. It will be shipped to Paris in the course of a few weeks.

We have received from E. P. Allis & Co., of Milwaukee, an illustrated catalogue of sawmill machinery made by them. This includes machinery embodying the latest improvements made by the firm, and also comprises a description of all the machines used in the modern sawmill.

The New York Belting and Packing Company have secured as their Southeastern agents the Atlanta Rubber Company, of Atlanta, Ga. This firm will carry a complete assortment of the New York Belting and Packing Company's vulcanized goods, from which an order can be filled without delay—a fact of interest to every one handling mechanical rubber goods in that section of the country.

The business of F. Lunkenheimer, known as the Cincinnati Brass Works, manufacturer of general brasswork and lubricators, carried on for the last 26 years, has been incorporated, and will be continued under the style of the Lunkenheimer Brass Mfg. Company, of Cincinnati, Ohio. The capital stock is \$250,000, all paid in. Fred. Lunkenheimer is president and manager, and Edmund Lunkenheimer is secretary and treasurer.

The Long & Jervis Foundry and Machine Company have removed from Decatur to Florence, Ala. Contracts have been made for three buildings, the machine shop being 50 x 100 feet; foundry, 50 x 90 feet; blacksmith shop, 30 x 50 feet. The capital of the company is \$25,000. A specialty will be made of architectural iron work and machinery of various kinds.

The following officers for the ensuing year were elected by the Standard Car Heating and Ventilating Company, of Pittsburgh, last week: Geo. Westinghouse, president; C. H. Jackson, vice-president and assistant treasurer; Robert Pitcairn, treasurer; A. T. Rowan, secre-

tary; Elmer L. White, assistant secretary, and H. H. Westinghouse and John Caldwell are the other directors.

An iron and brass foundry will shortly be established at Apollo, Pa. Casper Kettering is at the head of the new enterprise. At present facilities will be put in for making 6 and 8 ton castings. Two 10-ton and one smaller steam cranes will be put up at once; also two cupolas of from five to eight tons capacity.

The annual meeting of the stockholders of the Union Switch and Signal Company, of Pittsburgh, was held last week. The report of President George Westinghouse was read. It showed the earnings of the company for the year to be \$678,226.33. The expenses were \$561,481.62.

Hardware.

Ludlow-Saylor Wire Company, St. Louis, Mo., manufacturers of and dealers in wire, wire goods and art metal work in iron, brass, electro-bronze, &c., report a largely increased trade during the past two months. They have recently fitted up the office of Laconia Mfg. Company, Bedford, Me., and have also taken a large order for copper screening from St. Louis Water Works.

The New Process Twist Drill Company, Taunton, Mass., formerly doing business under the laws of the State of Maine, has been reorganized under the laws of Massachusetts, with the following officers: B. L. Dwinell, president; P. H. Corr, Treasurer; A. L. Lincoln, agent; W. F. Kennedy, clerk; J. E. Pope, superintendent. New machinery has been added and the capacity of the factory greatly increased, notwithstanding which they are running overtime on orders.

Anthony Wayne Mfg. Company, Fort Wayne, Ind., write us that their superintendent, Mr. Wichman, during one week last month sold over 1600 of their washing machines.

The works of the Nimick & Brittan Mfg. Company, of Pittsburgh, manufacturers of builders' hardware, have been idle for several weeks on account of the refusal of the employees to accept a reduction of 10 per cent. in wages tendered by the firm some time ago. It is expected that the trouble will be amicably arranged during the present week and that the works will again resume operations. The firm gives employment to about 250 men and boys.

Clement Mfg. Company, Northampton, Mass., manufacture both solid and hollow-handle cutlery in many styles, selling their product to silver-platers, who plate the goods and put them on the market. Their works are capable of producing 400 dozen per day.

In our issue of last week we made mention of the fact that the Wheeling Hinge Company, of Wheeling, W. Va., had made a reduction of 10 per cent. in the wages of their employees, and that a number of the employees had refused to accept the same. We are since advised that the men have accepted the reduction and returned to work. The entire plant is now being operated to its full capacity.

When the 50 new wire-nail machines now being constructed for the wire-nail factory of Carnegie, Phipps & Co., Limited, at Beaver Falls, Pa., are placed in position the capacity of the factory will be increased from 1800 to 2800 kegs of wire nails every 24 hours.

The Three Cornered Wire Nail Company, of Pittsburgh, who have been in process of organization for some months, are almost ready to begin the manufacture of nails. The company have recently secured the lease of the Nellis Agricultural Works, at the corner of Allegheny avenue and Re-

becca street, Allegheny City, Pa., and are now engaged in fitting up the works with the necessary machinery. The plant will be equipped with 42 Taylor wire nail machines, the invention of William Taylor, who is the general superintendent of the Three Cornered Wire Nail Company. The company will draw their own wire by a new process also invented by William Taylor, for which he has been granted patents. The company will manufacture all sizes of wire nails and expect to secure their share of the trade. The erection of a rod mill will also be commenced at an early date. J. C. Williams, the president of the Curry University, of Pittsburgh, is the president of the new concern.

J. W. Fiske, 21 and 23 Barclay street, New York, manufacturer of ornamental iron, bronze and zinc work, is constantly adding new goods to his line, such as guards, racks, mangers, &c. His assortment of brass and bronze goods in this line is especially complete, and he has recently fitted up J. B. Houston's stable, in this city, at a cost of \$5000.

Miscellaneous.

A press dispatch from Roanoke, Va., under date of the 15th inst., says: "The South Birmingham Coal and Coke Company were organized yesterday at Salem, this county, with a capital of \$1,000,000, with D. B. Strouse president and T. J. Schickel secretary and treasurer. Chas. F. Emery, of New York, is one of the directors. The company own 3000 acres of coal land 15 miles south of Birmingham, and will erect 100 coke ovens and a furnace at once. The principal office will be at Salem."

The Mount Torry Mining Company were organized in Winchester, Va., on the 15th inst., with a capital stock of \$1,500,000. B. H. Richards, of Baltimore, was elected president. The object of the company is to mine the manganese and iron ores on the Mount Torry furnace property, which lies between Buena Vista and the Crimora mines, in Augusta County. The company propose to begin operations at once.

Among recently authorized corporations in Illinois are the following: C. F. Scone Mfg. Company, Chicago; capital, \$50,000; to manufacture special machinery; incorporators, N. A. Ransom, R. J. Stone, C. F. Stone. Mills Permutation Lock Company, Chicago; capital, \$100,000; to manufacture locks; incorporators, J. Mills, J. Gard and F. C. Rowe. Keystone Lock Company, Chicago; capital, \$200,000; to manufacture light hardware; incorporators, William A. Gardner, Wallace Rice, Perley Hale. Leonard & Izard Company, Chicago; capital, \$800,000; to deal in engines, electrical appliances and supplies of all kinds; to build railways, furnish experts in electrical engineering work; incorporators, H. Ward Leonard, E. M. Izard, H. K. Tenney.

J. Bucknall Smith, in the first of a series of articles on wire and wire rope printed in the *London Engineer*, states that "probably no finer example of wire-rod rolling can be cited than that to be seen at Messrs. Pearson & Knowles' iron and steel rolling mills near Warrington, and where one patent rod mill is capable of rolling from 370 to 400 tons of No. 5 gauge rods per week." In this country there are a number of Garrett trains which can do very much better than that.

Owing to the recent fire at the Anaconda mines, Superintendent Marcus Daly has ordered the Chambers syndicate mines to shut down, and 600 men are out of work. The loss by the fire is estimated at more than \$1,000,000, and there was no insurance.

The Iron Age

New York, Thursday, March 21, 1889.

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF, JR., - - EDITOR.
GEO. W. COPE, - - - ASSOCIATE EDITOR, CHICAGO
RICHARD R. WILLIAMS, - - - HARDWARE EDITOR.
JOHN S. KING, - - - BUSINESS MANAGER.

The Outlook in the Iron Trade.

Meteorologically speaking, Pittsburgh seems have become temporarily a center of low barometric pressure for the iron trade, judging from some of the reports emanating from that place which have been given considerable currency. Were it not a little early before the annual struggle over the wages question, we would be inclined to regard them as preparatory to the coming campaign. The condition of affairs in the iron trade in Pittsburgh and elsewhere has not been satisfactory for a considerable time past. Our reports from every leading market in the country have accurately reflected it, and they have during the past few weeks shown flashes of light in the general gloom. As a matter of fact, March thus far has brought some isolated instances of improvement, which have given rise to the hope that the worst is over. Repeated disappointments have shaken the faith of the most sanguine, and with the overwhelming array of evidence of a discouraging character it takes unusual courage to express a belief in a more cheerful future. Persistency in predicting better times must ultimately be rewarded by final success. But few would be inclined to listen to sanguine views, and fewer still would act upon them.

The one great fact which is disturbing the minds of all interested in the iron and allied trades is the enormous production, notably of pig iron. Our monthly statistics show that we are making at the rate of over 7,750,000 gross tons this year, or more by 1,250,000 tons than in 1888. Such figures are well calculated to make anything but bearish arguments seem very feeble, and yet we think some points deserve consideration which make this alarming total appear less pregnant with coming disaster. First of all, then, we must insist that it is safer to divide the year 1888 into its first and second half, in order to bring out important facts. The apparent consumption of the first half—that is, the production, plus the imports and the fluctuation in the stocks—was 3,058,880 gross tons. In the second half it reached 3,628,753 gross tons. The latter figure is probably somewhat too high, because the stock statement at the close of the year did not include Bessemer iron held by consumers. Still the fact remains that in spite of constant complaints of poor business generally, in spite of the fact that the rail trade was very poor, the country consumed at the rate of over 7,200,000 gross tons of pig iron during the second half of 1888. Unfortunately we have only got the figures of the production of Bessemer pig in the two periods of last year. They stood 1,178,508 tons for the first and 1,463,310 tons for the second. Now, the production of steel rails for the corresponding time was 692,197 gross tons and 672,139 tons, which would represent respectively, allowing 12½

per cent. for waste, 778,722 and 756,157 tons as the quantity of pig consumed for rails. In other words, other articles than rails absorbed 807,867 more tons of Bessemer pig in the second half than in the first half.

The influence of the rail trade is naturally uppermost in the minds of the majority of those who study the situation. With the wretched state of affairs among the railroads themselves, the outlook is certainly discouraging enough, and yet the sales up to March 1, according to official reports, were 590,850 gross tons, to which must be added at least 40,000 tons for the new mill. Last year at the same time the forward sales were 565,629 tons, so that the amount of business booked is somewhat larger this year. Now, up to March 1 the deliveries were 147,787 gross tons, against 98,361 gross tons in 1888. The actual make, therefore, has been greater in nearly the same proportion. Official statistics to *The Iron Age* show that the rail mills having their own blast furnaces—viz.: Lackawanna, Pennsylvania, Edgar Thomson, Cleveland, Joliet, North Chicago and Union—produced in January 150,256 gross tons of pig iron, or at the rate of 4847 gross tons per day. In February the output was only 115,187 tons, or at the rate of 4112 tons per day, a falling off of 5145 tons per week. Of course only a part, which it is impossible to segregate, goes into rails, but the fact remains that there was a notable falling off in the product. Is not this the possible explanation of the recent slight rise in Bessemer pig in the West, which has puzzled so many, and was brought about by the buying of two large Pittsburgh mills, not included in the list of the works enumerated above?

In discussing our imports for 1888 in *The Iron Age* of February 14 we dwelt on the fact that their restriction, under present and prospective prices at home and abroad, would give a material addition of work to our home producers, provided the demand in this country remained in 1889 what it had been in 1888. Should the relative prices on both sides of the Atlantic be maintained, would it seem unreasonable that the imports of the following articles would be reduced as follows?

Articles.	Imports 1888.	Reduction 1889.
Pig iron.....	196,891	100,000
Steel rails.....	60,839	50,000
Steel blooms and billets.....	108,687	50,000
Wire rods.....	101,312	50,000
Totals.....	468,330	250,000

We believe that there is nothing sanguine in this estimate, considering the fact that our steel mills are well stocked with spiegeleisen; that there is no chance whatever of selling foreign rails here when they command \$28 at tidewater, and foreign cannot be laid down for less than \$40; that foreign billets and blooms are a few dollars higher than the domestic article, and foreign wire rods are driven out of the market, excepting a few points near the seaboard.

We are far from denying that the situation is grave, that we are producing pig iron at an excessive rate, and that we must be piling up notable quantities. But we hold that consumption outside of the rail trade is heavier than the majority in the trade have any conception of, that the rail trade is as heavy this year as it was in

1888, and that, furthermore, there is the prospect of more work through the crowding out of foreign products.

If we were not consuming pig iron and other products at a rate at least as great as we did during the second half of 1888—that is, at a rate of 7,200,000 tons or more—we would be piling up iron at the rate of over 45,000 tons a month. The course of the markets during January and February certainly does not justify the assumption that we are adding to stocks at anything like that rate.

Proposed Consolidation of Chicago Steel Interests.

Premature announcement was made last week by the public press of the consolidation of the North Chicago Rolling Mill Company, the Joliet Steel Company and the Union Steel Company. This consolidation has not yet been effected. We have been advised for some time of the movement in progress to accomplish this end, but have refrained from making any allusion to it at the request of those interested, who desired that negotiations should first attain a decisive stage. It will be some time in May before this point can be reached, and therefore all that is now said on the subject must be regarded as conditional. The managers and leading stockholders of the three companies are in favor of the proposed consolidation and are making arrangements to perfect it. But there are many details to be covered, individual opinions are to be harmonized, and the plan of consolidation must be ratified at stockholders' meetings of the three corporations before it can be put into practical operation. So far as known no insurmountable obstacles are to be encountered, but in a scheme so vast and covering such a variety of interests it would not be remarkable if something would develop to prevent its consummation. The great financial strength of each of the companies is in itself an argument against consolidation which may be urged by influential stockholders when they come to consider the subject in their general meeting. If two of the companies were weak and struggling for existence their owners might be expected to embrace gladly a proposition to relieve them of their burden, but this is far from being the case. It is believed, however, that no opposition of this kind will be met and that the stockholders of each company will be found to favor the scheme of consolidation by a very large majority.

The course of procedure in the organization of the new company, according to information received, is about as follows: The North Chicago Rolling Mill Company, possessing a special charter, will hold a meeting of stockholders early in May to vote upon a proposition to increase the capital stock of the company from its present issue of \$6,000,000 to probably \$25,000,000, also a proposition to authorize the purchase of the property of the Joliet Steel Company, and another proposition to authorize the purchase of the property of the Union Steel Company, or a consolidation of interests, as may be found preferable. In the meantime the stockholders of the other two companies will hold meetings to vote upon propositions to sell their property or consolidate with the North Chicago Rolling Mill Company.

The value of all the properties has been carefully determined and agreed upon, so that it is known what the consideration will be in case these preliminaries are settled favorably. A new company, probably named the Illinois Steel Company, will be formed to succeed the North Chicago Rolling Mill Company; the stock will be distributed to the stockholders of the original companies on an agreed basis, and the business of all will then be conducted under one management. No watered stock of any description will exist in this concern. Stock will only be issued by the company for value received in lands, buildings, machinery, cash and other assets of all descriptions. It will not be a trust, as some of the newspapers have termed the consolidation, but will be a purely legitimate business enterprise of large proportions. It is expected that after the consolidation is effected a cash capital of \$5,000,000 or more will be available for the purposes of the company. It is no part of the design of the managers of the various companies to in any way advance the selling price of their product, but rather by combining the experience and ability of all connected with the various organizations to produce finished materials on the most scientific and economical basis, so as to permit of the products being sold, if necessary, at lower figures in the future than in the past, insuring thereby the permanent existence of these industries, more particularly in Chicago and its neighborhood.

The properties to be included in the consolidation are the North Chicago Rolling Mill Company, who have at South Chicago a three-converter Bessemer plant, a Bessemer steel-rail mill and four blast furnaces; at North Chicago a two-converter Bessemer plant, a steel-rail mill, a structural-steel mill and two blast furnaces; at Milwaukee, mills for the manufacture of bar iron, fish plates, &c., a nail factory and two blast furnaces. The Joliet Steel Company have at Joliet a two-converter Bessemer plant, a steel-rail mill, a wire-rod mill and two blast furnaces. The Union Steel Company have at Chicago a two-converter Bessemer plant, a steel-rail mill and four blast furnaces. The total number of Bessemer converters is nine, and the total number of blast furnaces is 14. A new blast furnace is partly completed at Joliet. The annual capacity of the united works would be about 800,000 tons of pig iron, 900,000 tons of steel ingots, 850,000 tons of steel rails and 125,000 tons of miscellaneous products. At present the steel-converting capacity of some of the plants is greater than their rolling capacity, while in others it is less. In the associated operations of the works this inequality could be corrected, and other obvious advantages would be gained.

If the consolidation should be effected, its consequences would be momentous to the Northwest. Present advantages would be retained and strengthened, with the effect of considerably reducing competition from Eastern establishments engaged in the same line of business. Other branches of trade would be taken up by the new company as rapidly as they could be handled. The manufacture of structural material in all its varieties would assist in the localization of the bridge-building industry. The erection of plate mills would encourage the establishment of steel shipyards at

Chicago, where none now exist, although the business men of that city are heavily interested in lake shipping. A very long stride would be taken toward making Chicago industrially independent of the East, and the source to which the Northwest would look more than ever before for its supply of heavy material.

The Crisis in Copper.

Events have followed one another in rapid succession in copper, although the happenings have occurred almost exclusively on the other side of the Atlantic. The Comptoir d'Escompte has failed in spite of the aid extended it by the Bank of France, which is identified with the Government, and Morrison, Kekewisch & Co., who were the recognized London agents of the syndicate, have suspended. The Société des Métaux, too, is going into the hands of a liquidator. A heavy fall has taken place in the London market, where Chili bars have fluctuated between £35 and £40 for a day or two.

Here everybody is at sea. The Metal Exchange is getting a good deal of notoriety out of a system of bids and offers, ridiculously far apart, from which settling prices are made up which go out as quotations for the metal. As a matter of fact, no business has been done there lately, and *bona-fide* consumers could not secure metal for immediate use at anything like the prices named. There are so few sellers, and even a smaller number of buyers, that business is practically suspended.

The position is briefly this: What copper there is in stock in this country is held by the syndicate's agents, or by the bankers who have taken it over as collateral for loans to the Comptoir d'Escompte and the Société des Métaux. To what extent the American stock has been turned over to the Bank of France and those who acted with it lately and to what extent it is controlled by the banking houses here who were the fiscal agents of the speculators is not clearly apparent. None of this copper has been put on the market here. The mining companies who have co-operated with the Frenchmen—and they represent by far the greatest proportion of the output—have nothing to sell. They delivered as fast as they produced until the recent conference in this city. Then they agreed to stop deliveries under their contracts, from the 15th of March till the 15th of May, their credits being extended for two months, and to reduce the output by 20 per cent., the net price being put at 13 cents. Under this agreement the American mines are practically bound for two months to come, since, so far as they are concerned, the Société has thus far lived up to its contracts. Its failure will leave them with a year's extra large dividends as a remembrance of a Frenchman's folly. It is not likely that their position will be modified in any important particular until their representatives, who have gone abroad, have conferred with the leading interests abroad.

The principal element of uncertainty here grows out of the fact that the mines and the syndicate have made contracts with consumers for delivery of copper till the end of May at 16½ cents. It is obvious that something must be done to relieve the strain which this implies.

Manufacturers will buy outside brands where they can pick them up, at a much lower price, and may be able to reimport American copper returned duty free from abroad in the original packages. There is always the possibility, too, that some of the bankers involved may prefer to make a loss now to taking their chances of anything tangible being patched up in the future. We have reasons for the belief that the American mining companies, appreciating the situation, are discussing the question of canceling the April and May deliveries, with the object of combining with the actual holders of the stock of the metal in joint sales to consumers at a considerably lower basis, say 12½ or 13 cents for Lake copper.

The point now is to reach some basis which will inspire confidence among manufacturers and the whole trade which handles copper manufactures in one form or another. While the present chaos lasts no one who can possibly defer purchases of material into which copper enters will think of buying. While the uncertainty lasts it will be well to pay no attention to the nominal quotations which are so widely published. Because somebody jocularly inclined bids 5 cents for Lake copper and somebody in a jaunty way asks 16 cents, it does not by any means follow that the mean 10½ cents represents the market.

The Tidewater Soft Coal Pool.

After many weeks of negotiation the leading producing regions of bituminous coal destined for the Atlantic Coast north of the Chesapeake have perfected an association. Seven districts are interested in the movement, being in their importance in the order named: The Cumberland, Clearfield, Pocahontas, New River, West Virginia Central and Reynoldsville. The operators of the Beech Creek district have not yet signed the agreement, but are understood to be favorable to the association formed.

Broadly, the plan has the following features. The operators of the different regions appoint the members of a governing board, the Cumberland and Clearfield districts each having two, the others each one. The board has the power to determine what quantity of coal may be required by the markets, fix the prices and make the allotments to the different districts, by percentages. It has the right to revise these decisions, as occasion may require, the assent of the representatives of five of the regions being necessary. The agreement defines the territory of the pool as north of the Chesapeake and the Delaware, and provides that no member of the association shall have the right to deliver coal, by all-rail, into Connecticut or Rhode Island, or in certain territory in Eastern Massachusetts. Commissions to middlemen are fixed, rebates to customers and the guaranteeing of freight rates are prohibited, and the provision is made that all sales shall be made at tidewater at the prices fixed by the Governing Committee.

All complaints of irregularities must be submitted in writing to a commissioner, Galloway C. Morris, of Philadelphia, to whom very wide powers are given. Before the 15th of each month each producer must forward to the commissioner a sum equal to 20 cents on the total tonnage of the

preceding month. These sums remain in the treasury as a guarantee fund until three months' payments have accumulated. Then upon the payment of the fourth month's amount, the sum contributed in the first month is returned, and so on. In this manner about \$100,000 will accumulate in the treasury. Any infringements of the agreement are punished by the commissioner, who draws from the guarantee fund a sum in the form of a penalty of 20 cents a ton on the quantities involved in the violation. The penalties go into a compensating fund, out of which sums are given to those who have not shipped their allotment, any possible surplus being afterward distributed among the other concerns. The agreement is to be binding until March 1, 1892, a period of three years, the operators in the different regions distributing their allotment among themselves. The regions themselves have been allowed the following percentages:

	Allotment per cent.
1. Cumberland, Md.....	30½
2. Clearfield, Pa.....	30½
3. Norfolk and Western, Pocahontas, Va.....	14½
4. Chesapeake and Ohio, New River, W. Va.....	11
5. Beech Creek, Pa.....	7½
6. West Virginia Central.....	5½
7. Reynoldsville, Pa.....	1½
Total.....	100

The only change made, as compared with last year's allotment, is that the Cumberland and the Clearfield districts each have turned over ½ per cent. to the Pocahontas Flat Top district. It is estimated that the total tonnage will be about 5,500,000 tons, of which the Transatlantic steamship lines take about 1,000,000 tons, while a large part of the remainder is required by the New England railroad companies. The Governing Committee has announced the opening prices at \$2.60, f.o.b. Norfolk, Newport News, Baltimore, Georgetown and Philadelphia, and \$3.50, alongside, New York.

Such, broadly, is the general plan of the new pool from which the miners of soft coal for tidewater markets expect to realize fairly remunerative prices. They state that last year the profits were moderate, even in the most favored regions; that in other districts the operators have lost money, and that in one conspicuous case the appearance of prosperity has been given for stock-jobbing purposes. It is stated that the managers of a railroad, interested also in the coal district it serves, have bought coal at the mines. The railroad company, it is claimed, carried coal at very low figures—as low as 37 cents for a haul of 400 miles—undertaking also the selling of the coal. In this way the railroad has been used to advance the coal interest, the stockholders of the carrier being bled to put money into the pockets of the insiders, who are getting the coal stock ready for the public.

The price of soft coal to consumers, it is claimed, is not, therefore, unduly high, and does not place any burdens upon the manufacturer in the New England States. It is argued that however low the fuel might be put into the yards of New England iron manufacturers, no relief would be afforded them in their struggle against the inevitable tendency of the business to desert that section. It is urged that so far as the miscellaneous metal industries of that busy section are concerned, the fuel question with them is a minor point. So

long as New England manufacturers are far in advance of any of their competitors as ingenious mechanics and far-sighted business men, and so long as they have such a race of skilled workers to draw upon to fill their shops, they will control the trades in which they are now dominant. Manufacturers who are abandoning cheap water power for steam can certainly not claim that they are paying unduly high prices for their fuel.

While the advantages held by New England manufacturers will be fully recognized by every one familiar with that prosperous section of the country, it would seem a somewhat startling argument that their virtues should be made the pretext for placing burdens upon their shoulders. Especially since the West has been blessed with the cheap fuel utilized during the past few years, New England manufacturers have become more and more alive to the necessity of lowering their coal accounts. They have generally undertaken everything which might lower the cost of power. They have sought diligently to improve their boiler practice and have made heavy outlays in the direction of the most modern engines. They will view with alarm and dissatisfaction the steps which have been taken to enhance the cost of coal by pool methods. It is probable that they have more cause for uneasiness now than they have ever had, because the Seaboard Association has the appearance of greater strength than formerly.

American and Russian Petroleum Exports in 1888.

We are now in possession of statistics from Batoum, Russia, relating to the receipts of Caucasian petroleum at that port by rail from Baku, and the shipments from there to Russian ports and foreign countries. The stock at Batoum on December 31, 1888, is also given. The receipt of these details enables us to form some idea as to what Russian competition with our own petroleum really amounts to at present. The total shipments of petroleum from our oil regions amounted last year to 26,470,654 barrels of 42 gallons, leaving a stock on hand on December 31, 1888, of 18,595,474 barrels, as compared with 28,354,299 barrels, thus showing a decrease of stocks at the close of last year of 9,758,825 barrels. As the export in 1888 amounted to about 16,000,000 barrels, it appears that the domestic consumption reached about 10,000,000 barrels, constituting a total of 26,000,000 barrels delivered, representing 992,000,000 gallons of raw oil. The total runs during the year fluctuated between 1,200,000 and 1,400,000 barrels per month, May being the heaviest, with 1,449,298. While the total production of the year was 16,259,975 barrels, the deliveries from old stock and current production reached, as we have shown, about 26,000,000 barrels, therefore exceeded the output of the year by some 10,000,000 barrels. This fully demonstrated the effect of the shut-down movement inaugurated in September, 1887. The actual export of crude and refined, reduced to gallons crude, compares as follows with that of the previous year:

	1887. Gallons.	1888. Gallons.
New York.....	479,654,495	471,627,348
Philadelphia.....	193,776,717	166,380,036

Baltimore.....	12,741,061	6,886,325
Boston.....	5,609,544	4,693,722
Perth Amboy.....	23,434,260	21,611,707
From St. Louis by rail to Mexico.....	1,683,540	2,000,000
Total.....	715,902,617	673,149,638

The shipments of refined from New York alone were as follows:

	1888. Gallons.	1887. Gallons.
Countries.....		
England.....	48,711,457	50,969,977
Germany.....	88,450,153	74,906,882
Sweden and Norway.....	3,216,921	4,617,271
Denmark.....	2,352,219	3,510,832
Belgium.....	34,844,705	35,648,409
Holland.....	23,774,785	34,031,424
India and Siam.....	23,775,000	24,988,020
China and Japan.....	29,026,880	25,444,246
East Indies.....	21,423,892	22,357,620
Africa.....	3,229,947	8,851,845
Australia.....	6,782,340	4,238,564
New Zealand.....	1,660,380	1,171,990
South America.....	18,822,510	17,303,741
Central America.....	444,651	622,442
Mexico.....	1,744,451	1,912,070
Canada.....	1,955,563	1,935,455
Cuba.....	521,989	815,925
British West Indies and Guiana.....	1,964,515	1,953,445
Other West Indies.....	1,515,110	1,356,499
Other countries.....	5,000,690	8,742,725
Totals.....	319,228,753	325,408,772

It will be seen that the general falling off has not been more than about 6,000,000 gallons, or 2 per cent.—a mere trifle—and that it has only occurred to any great amount in our shipments to Holland, for which Germany has indemnified us. In other words, the Germans diverted some considerable business to their ports from the Dutch ports. The most interesting feature in our competition with Russia is that in the countries in which the Russians make the greatest efforts to supersede us—in India, China and Japan, as well as in the East Indies—New York shows a gain with refined petroleum. We may not lose ground there if we slacken our efforts in shipping always the very best to those regions, but at all events there is some consolation to reflect that there has actually been no loss of trade to speak of in our supplying non-European countries with the refined article from our port.

The receipts at Batoum last year consisted of 50,708 tank cars of petroleum, distributed as follows:

	Tank cars.
The Caspian-Black Sea Petroleum Company.....	20,848
Nobel Brothers.....	6,460
Burkhardt & Co.....	6,221
Rychner & Co.....	2,760
Naschauer & Co.....	2,420
Sundry consignees.....	11,994
Total.....	50,703

The tank cars contain 600 poods each, or together 30,421,800 poods, shipped as follows:

	Poods.
Russian ports.....	4,370,500
England.....	5,573,891
Turkey, Egypt and Syria.....	5,367,890
British India.....	4,369,466
Austria-Hungary.....	2,814,556
China.....	1,764,500
Japan.....	622,144
Germany.....	769,000
Italy.....	1,398,143
Belgium.....	1,420,170
Holland.....	97,550
France.....	114,900
Bulgaria, Roumania and Servia.....	285,600
Spain and Portugal.....	63,900
Total.....	29,032,210
Stock in Batoum, December 31, 1888,	1,389,590
Total supply.....	30,421,800

As the American petroleum barrel holds 9 poods refined, the total number of American barrels shipped from Batoum last year amounted to 3,225,700; adding thereto the stock at the close of last year of 154,300

barrels, it is shown that the total supply equaled 3,880,000 of our barrels, and that the aggregate export thence, including the Russian Black Sea ports, was only about one-fifth of what the United States shipped abroad. The shipments inland on the Volga and by rail amounted last year to about 10,000,000 poods additional.

CORRESPONDENCE.

Pig Iron Warrants.

To the Editor: Since writing you on the 20th I am in receipt of your issue of the 21st, and have read with interest the second batch of criticisms on the warrant company. With such a great variety of ideas as to what the warrant company is, it would be strange if there were not a great variety of criticisms. I am struck particularly by the great number of theoretical remedies advanced to correct the evils of the iron business, and that the writers lose sight entirely of the fact that these theories have never been lived up to and never will be.

Every iron-maker sees clearly when depression comes what his neighbor ought to do, but loses sight of the fact that said neighbor never has done and never will do that particular thing. The rich furnaceman argues that the poor furnaceman who cannot hold his stock ought to stop, but the poor furnaceman does not stop. He has obligations to meet, and runs his furnace to meet them. He argues that the rich furnaceman who can stop ought to do it. But the latter goes on piling up his stock, doing what he thinks to be to his interest, not what the general interest demands. It has been so in the past, and it will be so in the future.

Another writer says that no man has a right to build a furnace who has not money enough to run it, and loses sight of the fact that no matter how correct his theory is, it will not stop the objectionable practice. Furnace building, like other building, always costs more money than is estimated, and will do so as long as the world lasts. Builders start in with the belief that they have enough, but the actual cost always exceeds their estimate.

The question the iron-producer has to meet is, What is the best practicable remedy to apply to the business as it is? instead of satisfying himself of the great good that would come to him if the conditions were as they ought to be. Let them treat actual problems by actual experience, and not by worn-out theories. There is no better theory known than the free trade theory, but practical men know that its correctness ends when its practical application begins. Just so with the theories that have been advanced to correct the disadvantages existing in the iron business.

There are several conclusions pertaining to this question that are worthy of consideration.

1. That if, through some means, the needs of the iron business could be met, the evils existing corrected and discrepancies and differences adjusted, it would be a very desirable thing for that interest.

2. That a combination of the iron interests of the United States would hardly be possible, and, if possible, would not be desirable, as it would antagonize the public and bring about legislation to protect the public.

3. That a responsible company whose power is limited to issuing warrants over which they can hold no control has no objectionable features and might be used as a means of bringing about needed reforms in the iron trade.

4. That during each season of depression the rich furnaces submit to a long period of losing prices, looking forward to the

time when the poor furnaces will be out of their way and they can get the benefit of high prices; whereas, when the high prices come Great Britain, who has held her surplus stock under a warrant system, puts millions of tons in the American markets and thereby gets a large share of the benefit which our own furnaces should and under the warrant company's plan would reap.

5. That the country does not over-produce as long as it produces less than it consumes.

6. That it is more to the interests of the American furnaces to run constantly and supply our own demand fully than to lie idle part of the time and let the British furnaces furnish part of our supply.

7. That iron could be made cheaper if some means were adopted that would enable our furnaces to run steadily, instead of stopping during dull years.

8. That the carriage of iron on the local storage system, through which furnacemen pile up iron and borrow money on it, is a temporary and makeshift device, and therefore is unwise and unprofitable and can never result in stability or a large carriage.

9. That the carriage of stocks on the storage system, like the Marshall iron in Pittsburgh and the Philadelphia and Reading iron in Pennsylvania, must always be "a menace to the market," because it is not a permanent carriage.

10. That a system that would take the surplus iron off the hands of the producer at fair prices and provide a permanent carriage of that iron until needed would be a great relief to the producer.

11. That this can only be accomplished through a powerful and responsible company who can issue a negotiable warrant that will have sufficient standing to insure its being sought after and carried with confidence by the investor.

12. That every commodity that has been put in shape for investment has not only been permanently carried, but has brought about the result of reducing the fluctuations in the price of that commodity to a minimum and keeping the prevailing prices reasonably near the actual value.

13. That investment cannot continue or exist in any article without absorbing a certain amount of that article.

14. That every class of reliable security that investors have once taken hold of they have continued to carry to the full extent of issue.

The fear that such carriage by the investor would result in depressing the market is utterly groundless, and arises through unfamiliarity with the results attending the listing of other good securities.

Some writers fear that if such a carriage of iron by the investors were inaugurated the iron would be thrown on the market in case of a panic, to the great demoralization of prices. This is another plausible theory that actual experience in other securities disproves. In a panic investors always throw on the market the class of securities that, although quoted high to-day, may possibly be worth nothing to-morrow, and make haste to invest their money, instead, in some security that they know must always represent an absolute value. The very want of confidence in a great many of the articles of investment and the certainty in the value of iron might make a demand enough for the warrants to advance the price of them.

Many who have thoroughly examined the subject acknowledge that the warrant company is the only safe means of affording relief to the iron business. They are not only heartily and earnestly in favor of the warrant company, but are coming forward to co-operate with it. Furnaces representing an annual capacity of 770,000 tons, distributed over four iron-producing States, have already accepted

these facilities, and signed contracts with the company for 20 years. Additional furnaces representing an annual capacity of 650,000 tons have approved of the plans of the organization, and agreed to make contracts which only await the formal ratification of their boards of directors.

The fact that the warrant company cannot buy or sell pig iron warrants puts it entirely out of the reach of criticism. They can, however, refuse to take iron that is not up to the standard grade; hence they can bring about a uniform classification. They can refuse to deliver iron without a receipt; hence they can protect furnaces against short weight. Many writers acknowledge that the warrant company would be a benefit if it could be made a success, but cite a great many obstacles to its success. No obstacle has been suggested hitherto that the company is not willing to take upon itself the burden of overcoming. The warrant company stands on its merits. If it is a good thing it will endure and prosper. If it is a bad thing it will not, and, as one of your correspondents remarks, "It is here; let us give it a trial." Very truly,

GEORGE H. HULL,
President American Pig Iron Storage
Warrant Company.

NEW YORK, March 5, 1889.

This subject having been thoroughly ventilated, we must now consider the discussion closed.—EDITOR.

Motive Power at the Paris Exposition

The exhibits in the main hall of the Palais de Machines will be arranged in six rows extending lengthwise of the building. Four of the rows will be 50 feet wide, and two 38 feet. There will be four lines of main shafting, one to each of the four wide rows. Steam will be supplied by boilers placed in one of the courts, and so arranged that the different types may be examined. The total power is estimated at about 40 tons of water evaporated per hour. Steam will be supplied, says *Industries*, by a variety of boilers, all of which will be placed in one of the courts, so that the visitor may conveniently compare the different types of steam generators. The total power of the boilers is estimated at about 40 tons of feed-water evaporated per hour. The following firms are among the exhibitors in the boiler department: Belleville, de Mayer, Knap (London), Babcock & Wilcox (Glasgow), Davey Paxman (Colchester), Wehyer & Richmond, Fives-Lille, Dayde & Pillé, Roser, and Dulac. The distribution of steam to the various engines will be effected by underground steam-pipes laid in conduits throughout the length of the main building. The size of the pipes is calculated so as to give a maximum velocity of flow of 38 feet per second. Various boiler pressures will be used, but in the majority of cases the pressure will be between 90 and 120 pounds per square inch. To provide for the condensing engines, there will be two water mains running parallel with the steam-pipes, and both 2 feet diameter—one for the cold-water service bringing the water to the condensers, and the other for the return of the warm water. The administration pays the exhibitors of boilers, who supply steam for the general service, at the rate of 8500 francs (£340) per ton of steam delivered per hour during seven hours per day, and 180 working days. Should steam be required for a longer period than seven hours daily, the administration makes a further payment of 6 francs for each ton of steam; and if the exhibition should be prolonged beyond the 180 days, the payment will be 5 francs for each ton of steam supplied. Taking an average of 26 pounds of steam per horse-power hour, it will be seen from the

above figures that the administration pays at the rate of about $\frac{1}{4}$ d. per horse-power hour.

Of steam engines there will be shown a great variety, and the following are among the more important firms exhibiting in the motive power department: Société d'Anzin, Davey Paxman, Société le Phenix, Société de fabrication des locomotives et des machines de Winterthar, Société d'Oerlikon, André Berger de Thaur, Société alsacienne de constructions mécaniques de Mulhouse, Le Cruesot, Fives-Lille, Thomas Powell, Lecouteux et Garnier, Société française de matériel agricole de Vierzon, Biétreix, Boulet, Wehyer et Richemond, and Cail. The so-called "machine Casse," made by the Fives-Lille Company, will be the only example of the beam engine. This will be of 600 horse-power. The administration pays 40 francs per horse-power supplied during the whole time the exhibition is open, viz., seven hours per day for 180 days; and if the power is required after this period the payment will be $\frac{1}{4}$ d. per horse-power per hour. The four lines of shafting will be supported on bearings fixed to a system of standards, cross girders, and longitudinal girders, the latter also serving as supports for the traveling platforms, which will run the whole length of the main hall. These will be electrically worked, and used as travelers during the installment of the exhibits, and later on for the convenience of visitors, who will thus be carried from one end of the machinery hall to the other. The supply of feed and condensing water for a plant of boilers and engines representing about 4000 horse-power is a matter of some importance. The total quantity of water required per day is estimated at 6000 tons, or 850 tons per hour. The water will be pumped from the Seine and stored in elevated tanks of 166 tons capacity, the pumping plant being in duplicate, one by M.M. Quilacq & Meunier (Wheelock engine) and the other by M. Thomas Powell, Rouen (Worthington steam pumps). The water will be carried to the machinery gallery by a main of 2 feet diameter placed along the Avenue Suffren.

Washington News.

(From Our Regular Correspondent.)

WASHINGTON, D. C., March 19, 1889.

A few days ago a prominent Pennsylvanian, a friend of Secretary Windom, observed that Pennsylvania was getting nothing in the distribution of Administration favors and that New York was getting the lion's share. The Secretary replied, jokingly, "Well, you see, New York gets the offices, and we will give Pennsylvania protection."

This piece of pleasantry had more in it than might be thought. It is evidently the purpose of the Administration to prepare a scheme of customs duties which will afford ample protection to every industry which can be fostered to success in the United States, making the reduction of revenue more upon a restrictive policy toward foreign importations than upon reduction of duties, which invariably results in increased revenues. The Senate bill, with some improvements, will form the basis of the Administration measure.

The appointment of Mr. Tichenor to the Assistant Secretaryship of the Treasury, charged with the consideration of revenue questions and customs appeals and decisions, is in itself a guarantee of a vigorous protective policy. His long service in the office of supervising agent of the Treasury, and his familiarity with every branch of the customs business, are assurances of a fixed line of construction of tariff statutes on the side of protection.

It is understood that as soon as the administrative routine is well established the work of collating the material on hand for a tariff measure will be taken up. It is not improbable that Congress will be called into extra session about October to consider revenue matters in advance of the regular business of the session, which will be exceptionally important, relating particularly to an elaborate system of naval construction and coast defense.

The Bureau of Construction in the Navy Department is displaying considerable activity in preparations for the new vessels authorized by the late Congress. The vessels now building, authorized and provided for, and the latest list will when completed enable the United States to make quite a show on the ocean. The present Congress, however, when it gets to work on naval affairs, from all indications expressed by Senators and Representatives in convention, will provide for a long list of all classes of modern steel-armored and unarmored vessels. The new list comprises an armored steel cruising monitor not less than 3000 tons, 7500 indicated horse-power and maximum speed 17 knots an hour; a cruiser of the Vesuvius type, a dynamite gun battery, speed 21 knots an hour; two steel cruisers or gunboats, 800 to 1200 tons, and one large ram for harbor defense.

Deoxidized Bronze.

A representative of *The Iron Age* paid a visit recently to the foundry of the Deoxidized Metal Company, of Bridgeport, Conn., of which L. H. Bacon is president, O. C. Smith is secretary and treasurer and W. W. Keys is superintendent. The works are equipped with 23 crucible melting holes, which are to be supplemented in the near future with a large reverberatory furnace, to be heated with oil, capable of melting 10,000-pound charges. The foundry is to be enlarged by the addition of a building on adjoining property recently acquired, which is to be 80 x 180 feet, and is to be used chiefly for heavy loam work. Until now the largest castings of deoxidized bronze made were the rings of digesters for the bisulphite wood pulp process, which weighed 8500 pounds. Five rings and top and bottom casting composed such a digester 22 feet long, 7 feet 8 $\frac{1}{2}$ inches in diameter and weighed 28,000 pounds. Soon larger digesters are to be made, weighing 45,000 pounds, the company having orders for 19 of these large and 17 small digesters. Tests made in 1886 by Dr. T. M. Drown, of the Massachusetts Institute of Technology, proved the resistance of the metal to the corrosive action of bisulphite of lime. Experiments were made later, in 1887, by Prof. P. De P. Ricketts, of the Columbia School of Mines, from whose reports we tabulate the following results:

	Time.	Weight taken, grams.	Residue, grams.	Loss, grams.
Hot concentrated sulphuric acid.....	10 days	42.9816	41.9415	1.0401
Cold 50 % sulphuric.....	3 months	38.7500	38.7142	0.0418
Hot 50 % sulphuric.....	10 days	38.7142	38.6425	0.0717
Cold sulphurous acid.....	4 months	36.9640	36.9325	0.0315
Hot sulphurous acid.....	10 days	36.9325	36.8470	0.0855
Cold sulphurous acid with 5 % sol. sodium hyposulphite.....	4 months	39.2405	39.1738	0.0617
Cold solution with calcium and magnesium chlorides.....		39.0289	38.9115	0.1174
Cold conc. ammonia.....	4 months	38.2185	37.7550	0.5500

The fact that the use of the flux employed in melting by the company, which we understand consists chiefly of bor-

shavings, does remove the sub-oxide of copper so fatal to sound casting; of copper alloys is proved by the following analyses of Calumet and Hecla copper and deoxidized copper:

	C. & H. 1	C. & H. 2	C. & H. 3	Deoxidized.
Metallic copper.....	99.854	99.63	98.10	99.89
Sub-oxide of copper.....	0.233	0.324	1.95	0.07
Iron.....	0.015	0.011	...	0.01
Tin.....	0.021	...	...	0.01
Silver.....	0.012	0.024	0.08	0.08
Phosphorus.....	trace	...	trace	...

So far as the effect of deoxidizing upon the strength of copper is concerned, we may note the following results of tests made at the Watertown Arsenal: A deoxidized hard copper wire 0 104 inch diameter broke under a tensile strain of 69,730 pounds per square inch, showing a contraction of area of 1 per cent., a second similar wire showing 69,960 pounds and 2 per cent. respectively. A later report by W. N. Harris, chief engineer U. S. N., shows that 27 specimens of an alloy consisting of 88 parts of copper, 10 parts of tin and 2 parts of zinc, made by the Deoxidized Metal Company, and by the navy yards at Portsmouth, N. H., New York, and Norfolk, Va., showed that the tensile strength of the bronzes of the company was greater by 65.8 per cent. and the elastic limit was 58 per cent. better. The elongation was 53 per cent. less and the reduction of area 36 per cent. less.

The company use the alloy for a wide range of castings, like cylinders, pumps, bells, car trimmings, journal bearings, tuyeres for blast furnaces. They make also as a specialty very handsome and neat advertising articles, like letter openers, paper cutters and paper-weights, and have produced a wide variety of bronze nameplates for engine builders, machinists and manufacturers, among those supplied being the Westinghouse Company; the Lane & Bodley Company; the Eagle Iron Works, Detroit; Russell & Co., of Massillon, Ohio; the Benham Hydraulic Motor Company, of Providence; the National Water Purifying Company; the Ellithorpe Air Brake Company; P. T. Hodge Company, of Detroit, Mich.; Union Machine Company; Strong Locomotive Company; H. R. Worthington; the Vulcan Iron Works and John Mollenhauer & Co. An additional specialty of the company is the production of anti-friction metals and babbits.

Boys who have undergone mechanical training in the appropriate department in Girard College, Philadelphia, have comparatively little difficulty in securing good places in which to commence business. This statement is confirmed by the superintendent of mechanical instruction. Said T. Mason Mitchel, the gentleman referred to: "There are boys in South America, who have gone from here, earning \$2500 and \$3000 a year. They are all through the West, in New York and the Eastern States. The agent whose business it is to obtain places for the boys has very little trouble now, and we have many demands for the boys. They generally leave when they are about 15 or 16 years old, and with the knowledge they have obtained in this department many of them secure positions in workshops and manufacturing establishments paying them \$4 or \$5 a week. After that the boy must work out his future for himself. The trade of machinist seems to have the preference among the boys, and to this calling more go than either to wood-working, foundry-work or mechanical drawing. The advantage of school-taught mechanics gives the boy a standing upon entering workshops much above the raw beginner, and if he has proved a worthy student his acquirements are soon discovered, and his time under instruction in the shop is shortened, and he is generally paid much higher wages."

TRADE REPORT.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St.,
PHILADELPHIA, Pa., March 19, 1889.

Pig Iron.—The market has been very quiet since date of our last report, and while quotations are unchanged prices are not as firm as they were a week ago. One of the leading producers remarked that "he had seen a much worse market than the present one, inasmuch as Iron could be sold at a price. Concessions of from 10¢ to 25¢ per ton would enable them to place a great deal of Iron, while there had been times when it would have been impossible to sell large lots at anything near the market." This appears to voice the general sentiment—viz., that while the market is dull buyers could easily be found by shading prices a few cents per ton. The truth is that sellers cannot afford to make concessions, for which reason they seem determined to get current quotations or abandon the business, but it is impossible to say what conditions may be forced upon sellers before things take a turn. It is doubtful if any furnace is making money at to-day's rates, and not a few have it in mind to reduce their output unless things make a more encouraging showing within the next three or four weeks. Whether this will be the case or not is very hard to foresee. Under ordinary circumstances there ought to be an improvement, and the general drift of opinion is that such will be the case within the next 30 or 60 days. But unless the Southern and Western production can be marketed to their local trade it will be impossible for the East to show much rallying power. Efforts to secure bids during the past few days, especially for Southern Irons, do not afford much hope that such will be the case, although there is always a possibility of sudden changes in this respect, and while things are gloomy enough at the moment, a great deal might be said on the other side of the question. As, for instance, the low stocks, as well as the low prices of Iron. The probability of large crops during 1889, as well as the very satisfactory prices realized for those of 1888, is also an important factor. Then again, while trade is undoubtedly suffering by reason of the unsettled conditions of the railway interests, it is more than probable that these matters are already in much better condition than they were during 1888. The worst has been realized, improvement has already commenced, and it is contrary to the progressive spirit of the business community to believe that everything is going to the bow-wows. Then again, there is a disposition in some quarters to regard the financial difficulties in Paris as likely to cause some trouble here. Is it not more reasonable to regard the condition of the British Iron markets as more nearly affecting the United States? The cable dispatch to *The Iron Age* on March 13th had the following: "Holders of Pig Iron warrants have been realizing freely on this week's advance and the 'bears' have sold largely again the last few days. Makers' brands are strong at a further advance, the Continent and Canada being good customers. The demand for Steel of nearly all descriptions, as well as for Iron, is something enormous, and prices still show a rising tendency in all sections. Requirements for consumption and export alone necessitate heavy purchases. The fluctuations in prices during the week include 6d to 2/6 rise on Scotch Pigs, 3d on Cleveland Pigs, 6d on Hematites, 1/3 on Steel Rails and Billets, 2/6 on Steel Slabs, 6d on Steel Blooms and 3d on Bessemer and Siemens Steel Tin Plate." It is only fair to look at both sides of the question,

and while the immediate position of the Iron trade is far from satisfactory, there are gleams of sunshine as well as clouds of darkness. As to prices, the range for all qualities may be given about as follows for tidewater deliveries: No. 1 Southern to choice Pennsylvania, \$17 @ \$18.50; No. 2 do., \$16 @ \$17, and Gray Forge, \$15 @ \$15.50. Between these extremes sales are made according to quantity, quality, &c., the bulk of transactions being at medium figures.

Blooms.—There is a good deal of inquiry for Steel, and bids are made at extremely low figures, but sales appear to be on the basis of last week's prices, say: \$28 @ \$28.50, at mill, for Nail Slabs; \$29 @ \$30 for Sheet-Iron Billets; \$30 @ \$31 for Soft Tank, and \$35 @ \$36 for Flange purposes; Charcoal Blooms, \$52 @ \$54; Run-out Anthracite, \$41 @ \$42.50; Scrap Blooms, \$32 @ \$33 per "Bloom" ton of 2464 lb.

Muck Bars.—There is a little more interest shown in this department, and prices seem to be a trifle steadier. Sales are reported at from \$26.50 to \$27, delivered, and these may now be considered fair average prices.

Bar Iron.—The market remains in the dull condition possible, the absence of large orders for car building and pipe making being greatly missed at this season. There is very little demand except from stores and the smaller class of consumers—or large consumers who take only small lots—and at very irregular prices. As a matter of fact, there are no prices that leave a profit to the manufacturer, but there are plenty that are said to be below cost of production. This, of course, cannot continue much longer, but in the meantime it appears to be the general condition of things in this vicinity. Nominal rates are from 1.75¢ to 1.85¢ for best Refined Bars, but there is plenty of business done at less than the inside figures for what is claimed to be first quality Iron. Grooved Skelp is nominal at 1.70¢ @ 1.75¢, and Sheared at 1.80¢ @ 1.85¢.

Plate and Tank Material.—The demand is a little better in some respects, although not large enough to cause any special activity. Orders for several hundred tons of Ship Plate have been distributed around, and it is expected that other fair-sized orders will be given out shortly, but prices are at the lowest point yet reached, with no indication of stiffening until the demand becomes more active. Nominal quotations are about as follows: 1.90¢ @ 2¢ for Ordinary Plates and Tank Plates; 2.1¢ @ 2.2¢ for Universal Plates; Shell, 2.4¢ @ 2.5¢; Flange, 3.3¢ @ 3.4¢; Fire-Box, 3.5¢ @ 3.7¢; Steel Plates, Tank and Ship Plate, 2.1¢ @ 2.25¢; Shell, 2.7¢; Flange, 3¢ @ 3½¢; Fire-Box, 3¼¢ @ 3½¢.

Structural Material.—There is nothing new to report this week. Some of the mills are busier on specifications of material sold some time ago, but there is very little new work at the moment, although it is expected that a considerable amount of bridgework will come out within the next few weeks. Prices are about as quoted before, viz.: Bridge Plate, 2¢ @ 2.1¢; Angles, 1.95¢ @ 2.05¢; Tees, 2.4¢ @ 2.6¢; Beams and Channels, 2.8¢ for Iron or Steel.

Sheet Iron.—The demand keeps up very fairly, considering the depression in other departments. Sales are well up to the average for the season, and prices are steady at about the following quotations for small lots:

Best Refined, Nos. 26, 27 and 28.... 3 @ 3¼¢
Best Refined, Nos. 18 to 25.... 2½ @ 3 ¢
Common, ¼¢ less than the above.
Best Bloom Sheets, Nos. 26 to 28.... 4 @ 4¼¢
Best Bloom Sheets, Nos. 22 to 25.... 3½ @ 4 ¢
Best Bloom Sheets, Nos. 16 to 21.... 3¼ @ 3½¢
Blue Annealed..... 2½ @ 2¾¢
Best Bloom, Galvanized, discount..... 65 ¢
Common, discount..... 67½ ¢

Steel Rails.—The demand has not been important, but the feeling is becoming more confident and prices are very steady. It is possible that \$27.50 at mill might be accepted for specially desirable orders, but \$28 is the usual quotation, with a number of sales at that figure for small lots. The general impression is that prices will begin to improve soon, and that the lowest figures were made some time ago.

Old Rails.—There is very little doing, but prices seem to be without much change. There is less inquiry, and it might not be as easy to place large lots as it was recently, but the limited supply enables sellers to secure from \$24 to \$24.50 for lots delivered at mills near by. Nothing doing in lots in store or to arrive, so that \$23.50 @ \$24.50 are nominal quotations. A lot of 500 tons special quality of T's was sold here to-day at \$25, f.o.b. cars.

Scrap Iron.—The market is dull, and unless to parties actually in need of supplies it would not be easy to effect sales at last week's prices, although quotations are nominally as before, viz.: \$20.50 @ \$21 for cargo lots; \$21 @ \$21.50 for carload lots, delivered, or for choice \$22; No. 2 do., \$14 @ \$15; Turnings, \$18 @ \$14; Old Steel Rails, \$20 @ \$21; Cast Scrap, \$15 @ \$16; do. Borings, \$9 @ \$10; Old Fish Plates, \$23 @ \$24; Old Car-Wheels, \$17 @ \$18, Philadelphia.

Nails.—No improvement whatever. Several mills have stopped, and although there is a material decrease in the output, prices appear to be as demoralized as ever. Nominal quotations are \$1.90 @ \$2 from store, but carload lots are sold at all sorts of prices, according to brand, necessities of seller, &c.

Chicago.

Office of *The Iron Age*, 95 and 97 Washington Street, CHICAGO, March 18, 1889.

Pig Iron.—Dealers report a very quiet week. Some of them have been fortunate enough to book a fair tonnage, but it has been mainly in the closing of deals which have been in progress for some time. But little has occurred to indicate the tendency of prices, although some buyers have put forth "feelers" which have convinced them that for the present at least concessions will not be made by the manufacturers of Coke Irons. Bottom, therefore, seems to have been touched in this market, and while manufacturers are not hopeful of an early advance, yet they feel confident of maintaining values for some time at about their present range. Speculative inquiries have been received from outside parties who would be willing to invest at close prices, but they were not successful in finding manufacturers willing to meet their views, although quite a considerable number of furnace companies were approached for the purpose. A large contract for Castings, amounting to about 2200 tons, was awarded by the builders of the Milwaukee Avenue Cable Road to a distant foundry at prices below the bids made by Chicago parties. The proposed consolidation of the three steel companies is regarded with much interest by the Pig Iron trade, as it is believed that their large furnace capacity, which is not now wholly needed for their own requirements, may be partly diverted into the general market. This would cause such a competition for business that distant furnaces would have but a slight chance to dispose of any of their product here except in the case of those making special qualities. A revival of activity in the Steel Rail trade, however, would very considerably change this aspect of affairs. The demand for Lake Superior Charcoal is still dormant, but it is believed that large consumers would anticipate their usual buying season if the makers were inclined to lower their prices. Cash quotations are as follows,

f.o.b. Chicago: Lake Superior Coke, No. 1, \$16 @ \$16.50; No. 2, \$15 @ \$15.50; No. 3, \$14 @ \$14.50; Chicago Scotch, No. 1, \$17.50, for small quantities; Lake Superior Charcoal, Nos. 1 and 2, \$19.50; Nos. 3 to 6, \$20; American Scotch (Black-band), No. 1, \$18 @ \$19; Jackson County Silvery, No. 1, \$18 @ \$18.25; other Ohio Soft Irons, No. 1, \$17.25 @ \$17.50; Southern Coke, No. 1 Foundry, \$16.25 @ \$16.75; No. 2 Foundry and No. 1 Soft, \$15.75 @ \$16; No. 3 Foundry, \$15 @ \$15.50; Gray Forge and No. 2 Soft, \$14.50 @ \$14.75; Tennessee Charcoal, No. 1, \$19.

Bar Iron.—The condition of business has not improved, but the mills are not now soliciting orders with as much vigor as they were. Prices are too low to make large orders for future delivery at all desirable, unless raw material should be considerably cheapened. Quotations on mill lots of Good Common Iron range from 1.57½¢ to 1.62½¢, half extras, f.o.b. Chicago, with some mills willing to do a little better on desirable specifications. Store prices continue at 1.80¢ @ 2¢, according to quantity and quality.

Structural Iron.—In this line extreme dullness is reported. The season has not yet fairly opened, although the weather has latterly been so favorable for building that an active demand for material could have been reasonably expected, with so much work in sight. Prices are unchanged.

Plates, Tubes, &c.—Large transactions in Plates have occurred. The heaviest order was taken by J. T. Ryerson & Son, aggregating about 1000 tons of Steel, for conduits for the Milwaukee Avenue Cable Road, on private terms. A number of smaller orders ranged from 20 to 80 tons. Store business was also quite satisfactory. Very low prices were made on mill orders, but store quotations are unchanged.

Sheet Iron.—The demand for Black Sheets for present requirements is very limited, but large orders could be secured for late summer and fall delivery if the mills were willing to enter them at current quotations. Buyers have pretty thoroughly tested the manufacturers on this point, but have found them disinclined to meet their wishes. Prices are so low that the manufacturers believe a lower range of values hardly possible, and they prefer to keep themselves in a position to profit by an improvement if it should come along in the meantime. The mills making the best grades of Sheet Iron are understood to be pretty well filled with orders from the general trade, so that they are able to maintain this attitude. Quotations on mill lots of No. 27 for delivery range at about 2.85¢ @ 2.90¢, f.o.b. Chicago. Small lots of No. 27 are sold at 3.10¢ @ 3.20¢ from store, but the movement is now quite light.

Galvanized Iron.—A very remarkable change has taken place in the business done by manufacturers' agents. Orders have been received for large quantities. The apparent opening of spring and the very mild weather have evidently stimulated all classes of business consuming Galvanized Iron. Buyers are so urgent in numerous instances that agents have been obliged to wire their orders to give dispatch. If trade continues at its present pace this month will show the heaviest sales ever made by some of the houses represented here. Prices are unchanged, small lots being still quoted by jobbers at 65 % off for Juniata, and 65 % and 2½ % for 'harcoal, while manufacturers' agents ask from 2½ % to 5 % more on similar lots.

Merchant Steel.—The demand for Tool Steel increased considerably during the past week, some dealers reporting a growth in business of fully 50 % on the previous week. The resumption of quar-

rying and other outdoor work has evidently caused the improvement. Prices are unchanged.

Steel Rails.—No sales of any consequence were made during the week. Manufacturers are accepting the situation as cheerfully as possible under the circumstances, believing that a better trade will surely come along in the course of the summer. Quotations are unchanged at \$30 @ \$30.50.

Old Rails and Wheels.—No transactions in Old Rails have come to light. Holders ask \$21, and bids of \$20.80 have been refused. There is nothing doing in Old Car-Wheels. Holders will not accept \$18.50, but insist that they must get \$19.

Scrap.—A little more inquiry from consumers is noted, but actual business is light. There is apparently no market for Wrought Scrap, but small sales have been made of low grade material. Cast is very quiet. The inquiry for Mixed Steel referred to last week did not result in business. Quotations are nominally unchanged.

General Hardware.—The demand for Shelf and Heavy Hardware has quickened very decidedly, and most jobbers report an excellent trade in progress. Stocks of staple goods are diminishing very rapidly and a firmer feeling is perceptible in the lines which have latterly been most depressed. The advance in Screws has presumably checked sales for the time being, but, as stocks in distributors' hands are known to be light, an early revival is anticipated, which may be hastened by the intimations now circulating of another advance in contemplation by the manufacturers. Collections are not so good as they have been, quite a large percentage of the country trade asking for a little more time, desiring bills dated ahead and resorting to devices for deferring payments usual when they are not able to make prompt collections from their own customers.

Nails.—Jobbers are still in control of this market, selling Steel Nails at \$1.95 for carload lots and \$2 @ \$2.05 for small lots, and Wire Nails at \$2.35 for carload lots and \$2.40 for small lots; but their stocks are being depleted, and they are talking of advancing prices to correspond with manufacturers' rates. Wire Nails are especially firm.

Barb Wire.—The remarks concerning Nails are applicable to Barb Wire, which is still being sold by jobbers at 2.75¢ @ 2.80¢ for small lots of Painted, with the usual reduction for carloads, and Galvanized at 60¢ @ 65¢ @ 100 lb advance over Painted. A firmer feeling is developing among the jobbers, and it would not be surprising if a slight advance should soon take place.

Pig Lead.—Dealers report rumors of large sales at 3.55¢ to the local trade, but on investigation they have ascertained that the bulk of the Lead sold was for shipment. A better inquiry is noted at the close of the week.

Cincinnati.

Office of The Iron Age, Fourth and Main Sts.
CINCINNATI, March 18, 1889.

Pig Iron.—The local market for Pig Iron has been quiet throughout the week. A few large contracts have been negotiated, but all have not been consummated. The bulk of business has been confined to carload lots, but several sales of 1000-ton lots have been effected—one lot of 1500 tons, one of 1200 tons and one of 1000 tons, all of Foundry grades, at the same range of prices as were quoted a week ago. Also 1000 tons Gray Forge Iron at \$13.25 and 1000 tons ditto at \$13.50, cash, here. There has been little call for Car-Wheel

Iron, but the offerings have been small. A keen observer of the situation remarks that the light present consumption of Pig is the weakest factor in the market, foundries, rolling mills and agricultural works alike showing a light business. Prices of the higher grades of both Foundry and Forge Irons are well sustained, and even the lower grades are not quotably lower. Neither buyers nor sellers are as decided or pronounced in their views as they were a few weeks since, and the undercurrent has a neutral tint. The following are the approximate prices current here at the close for cash, f.o.b.:

Foundry.	
Southern Coke, No. 1 (new classification)	\$15.00 @ \$15.50
Southern Coke, No. 2 (new classification)	14.50 @ 14.75
Southern Coke, No. 3 (new classification)	14.00 @ 14.25
Ohio Soft Stone Coal, No. 1	15.00 @ 16.00
Ohio Soft Stone Coal, No. 2	14.50 @ 15.00
Mahoning and Shenango Valley	16.50 @ 17.00
Hanging Rock Charcoal, No. 1	21.00 @ 22.00
Hanging Rock Charcoal, No. 2	19.00 @ 20.00
Tennessee and Alabama Charcoal, No. 1	18.00 @ 18.50
Tennessee and Alabama Charcoal, No. 2	17.00 @ 18.00

Forge.	
Strong Neutral Coke	13.00 @ 13.50
Mottled Neutral Coke	12.25 @ 12.50
Gray Forge	13.00 @ 13.25

Car-Wheel and Malleable Irons.	
Southern Car-Wheel	20.00 @ 25.00
Hanging Rock, Cold Blast	22.00 @ 25.00
Lake Superior Car-Wheel and Malleable	21.00 @ 22.00

Manufactured Iron.—The market has ruled slow and easy, even agricultural works, which are usually busy at this season, showing a small order-book; mills and foundries are alike dull, but prices are without change of importance.

Nails.—There has been a fair demand and a steady market for both Iron and Steel. 12d @ 40d sell at \$1.95 @ \$2 per keg, with 10¢ rebate in carload lots at the mills. Steel Nails sell at \$1.90 @ \$2, and Steel Wire Nails at \$2.55 @ \$2.60 per keg.

Old Material.—There has been a fair demand and moderate sales of Old Rails at \$21, cash, here, but Old Wheels have remained quiet, though steady, at about \$18.50, cash, at Cincinnati.

Cleveland.

(CLEVELAND, March 18, 1889.

Iron Ore.—About 600,000 tons of new Ore have been sold in Chicago during the past week, but the details of the sale are very rigorously guarded. Outside of the Minnesota Ores involved in the transaction there is little basis upon which to establish prices. Much of the Ore is from the Norrie mine, whose stockholders are also stockholders in the consolidated mills of Chicago and vicinity. More of it is of a grade of Bessemer Ore something below such standards as the Republic and Champion. Considerable Minnesota Ore was also included in the lot. All of the Ore was sold at mine prices and, from the best evidence obtainable, the Minnesota Ore brought a price equivalent to \$4.50, f.o.b. vessels at Two Harbors. Six or seven of the most prominent Ore men in the city were at Chicago last week completing the negotiations. About half of the Ore will go to Chicago by rail and the other half on boats belonging to the purchasers, with an aggregate tonnage of 500,000 tons. None of the sales comprising this large transaction is contingent upon vessel rates or freight charges from the mines to the shipping ports. The representatives of the mining companies are now at home responding to the vigorous inquiries for new Ore pouring in from every quarter. A sale of Minnesota Ore for far Eastern delivery is reported to-day at a price said to be equivalent to \$5.75, f.o.b. vessels Buffalo. It is not known definitely how much Ore is involved in the last-mentioned sale.

but it is believed that the amount is not less than 40,000 tons. Negotiations are now pending for considerable Chapin Ore to be sent to the same furnaces at prices equivalent to \$5.15 or \$5.20, f.o.b. vessels Buffalo. All of the Ore companies in this city are anticipating liberal orders from this new market, which seems likely to make a surplus production out of the question. The heavy buyers in the Mahoning and Shenango valleys have yet to close contracts for new Ore, although everything now indicates the immediate opening of the market at an average advance of about 80¢ or 40¢ over last season's opening prices. Three additional vessel charters are reported to-day at \$1.10 from Escanaba, and there is now every indication of this figure being agreed upon as a season rate from that port, although 125,000 tons of Minnesota Ore will be carried to Buffalo, at the rate of about 30,000 tons per month, at \$1.25 ¢ ton.

Pig Iron.—The market continues to improve both in firmness and prices. Sales of Bessemer and Foundry Irons have occurred during the past week at an advance of from 25¢ to 50¢ over last week's quotations. Many heavy purchasers are evidently in the market with the purpose in view of piling up their stocks before any additional advances are reported. Sellers view the situation calmly, and seem in no mood for forcing sales or pleading for purchasers.

Manufactured Iron.—Common Bar at 1.60¢, at the mill, is not particularly strong, and Sheets are weak at present prices, based upon No. 24 at 2.75¢.

Scrap Iron.—A small lot of Old Axles sold during the week for \$24.50. Some improvement is noted in the market for Rails, old Americans now being quoted at \$21.75 @ \$22.25, with several sales at the former figure.

Pickands, Mather & Co., dealers in Lake Superior Iron Ores and exclusive agents for the Minnesota Iron Company, the Chandler Iron Company and the Colby, Milwaukee and North Champion mines, have opened an Eastern office at 222 South Third street, Philadelphia. Edmund D. Smith & Co. are the Eastern agents of the firm.

St. Louis.

Office of *The Iron Age*, 212 N. Sixth st.,
St. Louis, March 18, 1889.

Pig Iron.—The general condition of the market remained unchanged. There is a fair demand, but buyers seem rather indifferent and are not disposed to pay any advance for future supplies. It is evident that large consumers are holding off, anticipating a lower scale of prices, but furnaces are firm in their determination not to cut prices, and are refusing to sell for more than a few weeks ahead. Prices are holding up very well considering the dullness of the past week, and are being strictly adhered to as quoted herewith:

Southern Coke, No. 1 Foundry, \$15.50 @ \$16.00
Southern Coke, No. 2 Foundry, 15.00 @ 15.25
Southern Coke, No. 3 Foundry, 14.50 @ 14.75
Gray Forge, 18.50 @ 14.00
Ohio Softeners, 18.00 @ 21.00
Lake Superior Charcoal, 21.00 @ 21.50

Missouri.

Charcoal Foundry, No. 1, 16.00 @ 16.50
Charcoal Foundry, No. 2, 15.00 @ 15.50

Tennessee.

Charcoal Foundry, No. 1, 17.50 @ 18.50
Charcoal Foundry, No. 2, 16.75 @ 17.50
Connellsville Coke, f.o.b. East St. Louis, \$4.70; St. Louis, \$4.85.

Bar Iron.—There is considerable business being transacted in this department, and during the past week some good-sized orders were taken for railroad work. Prices are weak and unsettled, and it depends entirely upon the size of the order

what terms are made. Small lots from store are quoted at \$1.80; carload lots from \$1.65 to \$1.75, according to circumstances.

Barb Wire.—It is difficult to ascertain anything that is of an encouraging nature, either as regards prices or amount of business being transacted. Mills are spasmodically employed, and there is no demand that can be relied upon to continue for any length of time, and the only symptom that can be construed into being favorable is the opening up of country roads, allowing farmers an opportunity of laying in stocks of Wire for spring consumption. Prices show no improvement whatever, and unless the demand increases very shortly are likely to be lower, as there is very little trade to go round, with too many after it. Prices are quoted as follows: For carload lots Two and Four Point Painted, \$2.80; carload lots Two and Four Point Galvanized, \$3.40, f.o.b. St. Louis; less than carload lots, 5¢ additional.

Detroit.

WILLIAM F. JARVIS & Co., under date of March 18, 1889, report as follows: While no large sales have been reported in this market during the past week, there has been a greater number of carload and 50-ton orders, and inquiries have been received from so many different points in the East that it looks as if an active buying would soon take place. The present warm weather, if it continues for any length of time, will hasten the opening of navigation, and buyers for early navigation delivery will place their orders earlier than usual. The Detroit and Cleveland Steam Navigation Company start their boats between Detroit and Cleveland on Wednesday of this week, and rates to Eastern points will therefore be less and will allow Irons in this section a better chance to compete for Eastern business. We quote as follows:

Lake Superior Charcoal, all numbers	\$19.50 @ \$20.00
Lake Superior Coke, all ore	18.75 @ 19.25
Lake Superior Coke, cinder mixed	17.75 @ 18.25
Standard Ohio Black Band	18.75 @ 19.25
Southern No. 1	17.00 @ 17.50
Southern Gray Forge	15.00 @ 15.50
Southern Silvery	16.50 @ 17.00
Jackson County (Ohio) Silvery	18.25 @ 18.75
Old Wheels	18.50 @ 19.00

Chattanooga.

Office of *The Iron Age*, Carter and 9th Sts.,
CHATTANOOGA, March 18, 1889.

Pig Iron.—Notwithstanding there is an active demand and heavy movements of Iron, prices still remain about stationary and without the advance that was anticipated some three or four weeks ago. Very little Iron, however, is accumulating in the yards and many of the furnaces are shipped up close, and unless the stack be running freely on No. 1 orders for this grade for immediate shipments are declined. The situation appears to be about in this condition: Very active demand, heavy shipments and very low prices. How long this condition of the Pig Iron market will continue appears to be so far an unsolved problem. Under the general rules that govern commercial affairs, as well as the still more active demand that will undoubtedly arise as the spring advances, it can hardly be otherwise than that prices will advance within a short time. The uncertainty of the future, however, has very strongly induced furnaces to continue to sell their outputs at present figures, and many of them have made contracts that extend quite far into the year. The best grades from furnaces that have a reputation are commanding the high prices named last week, and those furnaces that make an off-grade and those

whose reputation is not fully established are disposing of their output at 25¢ to 75¢ off. Purchases for speculative purposes are just now a little off, although there is still an occasional transaction on this account.

Pittsburgh.

Office of *The Iron Age*, 77 Fourth Ave.,
PITTSBURGH, March 19, 1889.

The general Iron and Steel trade has not improved much the past week. The Iron failures and assignments within the past few weeks at different points throughout the country have had a bad effect upon the trade. We are assured that there are mills booking orders at prices that do not cover actual cost of production, and these are getting the bulk of the business, but it is only a question of time when the works will pass into the hands of assignees, and probably be sold out for the benefit of the creditors.

The river Coal trade continues in a very depressed condition. Since the first of the present month nearly 12,000,000 bushels have been shipped away from Pittsburgh by river, and all the down-river markets are overstocked and very dull, with prices away down to lay-down cost, if not below the same.

Pig Iron.—The market has been less active the past week, the volume of business reported having been considerably below that of the two preceding weeks. However, notwithstanding there has been a falling off in the demand, prices are still maintained, and sellers are apparently not any more numerous than buyers. Our city furnaces are all sold up, and are making no effort to obtain additional contracts. Furnaces in the Shenango and Mahoning valleys are not anxious to sell in this market at present prices, as they say they can do better at home. Bessemer appears to be more inquired for than any other kind, and is firmer in consequence. Foundry Irons have been a little more active during the past few weeks, but the demand is chiefly of a hand-to-mouth character. We quote prices as follows:

Neutral Gray Forge	\$14.50 @	cash
All Ore Mill	15.50 @	16.00
White and Mottled	14.00 @	14.25
No. 1 Foundry	18.00 @	18.50
No. 2 Foundry	15.25 @	15.50
No. 2 Charcoal Foundry	21.50 @	22.00
Cold Blast Charcoal	25.00 @	27.00
Bessemer Iron	16.75 @	16.00

The only sale of Bessemer Iron reported was 1000 tons, at \$16.80, cash; we can also report a sale of 1200 tons Gray Forge at \$14.50, cash, which appears to be the ruling price.

Spiegel and Manganese.—The upward movement in Manganese noted in our last report still continues, and the prices of a week ago cannot now be duplicated. The price now quoted is \$60 ¢ ton for 80 ¢. Spiegel remains about as last quoted—\$28.50 @ \$29 for 20 ¢.

Muck Bar.—There is no change to note in the general position of the market; demand continues light, especially for immediate delivery; some sales could be made for future delivery, but makers do not appear disposed to contract ahead at present prices. We hear of some small sales at \$27, cash, for immediate delivery, and some of the brokers intimate that it can be bought for less.

Manufactured Iron.—Trade continues slow for the season, and prices are unsettled and unsatisfactory; it is thought, however, that there will be an improvement in the demand before the close of the month. We quote Bars at 1.65¢ @ 1.75¢; Plates, 2.10¢ @ 2.15¢; No. 24 Sheet, 2.50¢ @ 2.75¢; Skelp at 1.05¢ for Grooved, and 1.95¢ for Sheared; all 60 days, 2 ¢ off for cash.

Nails.—The Nail trade continues dull, and the prospect for improvement is not very encouraging at present; usually there

is a good trade in March, but at present there is very little doing. Pittsburgh makers continue to hold firmly at lower rates, which they claim afford only a small margin for profit. We continue to quote at \$1.90 for 12d to 40d, 60 days, 2 % off for cash.

Wrought-Iron Pipe.—There is a very fair business; the demand is increasing, but prices show no improvement, and the latter is the discouraging feature connected with the business. It is claimed that orders have been taken within the past few weeks at prices that, under the most favorable circumstances, do not more than cover actual cost of production. This being the condition of the market, some firms are making but little effort to obtain business. Their main object is to hold their regular customers if possible. Discounts are quoted as follows: Black Butt-Welded Pipe, 60 %; Galvanized do., 52½ %; Black Lap-Welded, 70 %; Galvanized do., 55 % @ 57½ %. These quotations apply only to car lots. Boiler Tubes, 65 and 10 % off regular list; 2-inch Tubing, 11¢ per foot, net; 5½-inch Casing, 32¢ @ 33¢ per foot, net.

Old Rails.—There is more inquiry, but there have been no sales reported in this market for some weeks. American Tees are quoted nominally at \$23 @ \$23.50. While there is not much doing, the belief obtains that prices will rule higher as soon as the demand opens up, as the visible supply is small and steadily growing less.

Steel Rails.—The local market remains much the same as noted a week ago. The movement on foot among manufacturers for better prices meets with approbation here, provided it is carried out in good faith. It is well known that the prices current for some time past have been unsatisfactory and unremunerative. It is believed that there will be an improved demand before long, as prices are low and buyers may become aroused to the possibility of an advance. For small orders prices are still quoted at \$28 @ \$28.50, cash, but large orders can be placed for considerably less.

Blooms, Billets, &c.—There is not much inquiry, and in the absence of recent sales may be quoted at \$27.50, cash. Domestic Bloom and Rail Ends quoted at \$18 @ \$18.50, cash.

Railway Track Supplies.—Spikes are lower and we now quote at 2¢, 30 days, free on cars in Pittsburgh; Splice Bars, quotable at 1.70¢ @ 1.75¢, and Track Bolts at 2.75¢ with Square and 2.85¢ with Hexagon Nuts.

Merchant Steel.—There is no improvement in the demand, and prices continue unsettled and unsatisfactory.

Old Material.—Demand continues light and prices weak. No. 1 Wrought Scrap, \$19 @ \$19.50, net ton; Wrought Turnings, \$13 @ \$13.50; Car Axles, \$24 @ \$24.50; Cast Scrap, \$14.50 @ \$15, gross ton; Cast Borings, \$11 @ \$12, gross; Car-Wheels, \$19 @ \$19.50; Old Steel Rails, \$17.50 @ \$18 for short and \$19 @ \$20 for long lengths.

Louisville.

LOUISVILLE, KY., March 18, 1889.

There have been a fair number of sales reported during the last week in 100-ton lots. Two sales of 1000 tons each, one Lake Superior, the other Southern Forge and Bright Irons, are the largest sales reported. The prices were low, but at an advance over the lowest sales so far. It is hoped that the market from now on will show a slight improvement, and some of the largest buyers state that they think

prices during the spring and summer will advance probably \$1 per ton. We quote as follows:

Southern Coke, No. 1 Foundry, new classification.....	\$14.75 @ \$15.25
Southern Coke, No. 2 Foundry, new classification.....	14.25 @ 14.75
Southern Coke, No. 3 Foundry, new classification.....	13.75 @ 14.25
Gray Forge.....	13.25 @ 13.75
White and Mottled, different grades.....	12.75 @ 13.25
Silver Gray, different grades.....	13.00 @ 13.50
Southern Charcoal, No. 1 Foundry.....	16.25 @ 16.75
No. 1 Mill.....	14.75 @ 15.25
Southern Car-Wheel, standard brands.....	21.75 @ 22.75
Southern Car-Wheel, other brands.....	18.00 @ 19.50
Hanging Rock Coke, No. 1 Foundry.....	15.50 @ 16.00
Hanging Rock Charcoal, No. 1 Foundry.....	19.50 @ 21.00
Hanging Rock, Cold Blast.....	20.75 @ 23.75

New York.

Office of The Iron Age, 66 and 68 Duane street, New York, March 19, 1889.

American Pig.—The market is quiet, with only a moderate amount of business being transacted. As reported last week as probable, we note elsewhere the lower opening prices for Ore made by Withersbees, Sherman & Co., of Port Henry, N. Y. We quote for standard Northern brands, tidewater delivery, \$17.50 @ \$18 for No. 1 Foundry; \$16.25 @ \$17 for No. 2 Foundry, and \$15 @ \$15.50 for Gray Forge.

Scotch Pig.—The market is very quiet, and there is little doing, in spite of the fact that Iron cannot be laid down at present prices on the basis of cost in Scotland. We quote: Coltness, \$20.50 @ \$21; Shotts, \$20 @ \$20.50; Langloan, \$20 @ \$20.50; Summerlee, \$20.25 @ \$20.50 and Dalmellington, \$19.25 @ \$19.50.

Spiegeleisen and Ferromanganese.—We note a sale of about 5000 tons of 20 % Spiegeleisen to a Rail mill at private terms. Several additional negotiations are under way, the market being \$28 @ \$28.50. A number of lots of Ferro were sold at \$57 @ \$58 for 80 %.

Structural Iron.—Very little new work of magnitude was closed during the week under review. The Rochester bridge alluded to was taken by a local concern. Prices continue low, without any immediate prospect of recovery. We quote: Sheared Plates, 1.9¢ @ 2¢; Universal Mill Plates, 2¢ @ 2.1¢; Angles, 1.9¢ @ 2.1¢; Tees, 2.35¢ @ 2.5¢, and Channels and Beams, 2.8¢, on dock.

Plates.—We quote Iron Tank, 1.9¢ @ 2.2¢; Shell, 2.25¢ @ 2.4¢; Steel Tank and Ship Plate, 2.1¢ @ 2.25¢; Shell, 2.35¢ @ 2.5¢; Flange, 2.6¢ @ 2.75¢, and Fire-box, 3¼¢ @ 4¢.

Bar Iron.—We quote: Carload lots on dock, half extras, Common, 1.65¢ @ 1.7¢; Medium, 1.7¢ @ 1.75¢, and Refined, 1.75¢ @ 2¢.

Steel Rails.—Sales have been light, not aggregating more than about 6000 tons East and West. There are some new orders in the market, and a number of those already alluded to have not been closed. Prices now are firm at \$27, at mill, as Eastern mill efforts to buy a shade lower than this have been unsuccessful. This is equivalent to \$27.75 @ \$28, at tidewater, according to location of mill, and represents an advance of about \$1 per ton over the lowest point reached, which was a shade under \$26, at mill. It is reported, too, that Pittsburgh has withdrawn its lowest figures, which were \$26 @ \$26.50, and is now asking \$27 @ \$27.50, at mill, for large quantities. Negotiations are pending for the purchase of an additional allotment at about \$25 a ton by an Eastern mill.

Wire Rods.—There has been a sale of about 500 tons at a sterling price, and Basic Rods continue steady at \$41 @ \$41.50. Belgian Acid Rods have been

offered by one party lately as low as \$39.25. In Pittsburgh the mills are full of business, the selling price being \$41 @ \$41.50, at mill, which prevents Foreign Rods from going far inland.

Old Rails.—We note a sale of 500 tons of American Old Rails from a road in this vicinity at \$23. In the West the tone is better.

Track Material.—The market is dull at \$2 for Spikes, and \$1.75 @ \$1.85, delivered, for Angle Bars.

Scrap Iron.—While there is more inquiry for No. 1 Scrap, prices as a whole remained unchanged. We quote for cargo lots: No. 1 Scrap, \$20 @ \$21, delivered on boat; Turnings, \$13 @ \$14, do.; Cast Scrap, \$15.50 @ \$16, do.; Cast Borings, \$12.50 @ \$13.50, and Horseshoes, \$23 @ \$23.50.

Coal Market.

The adoption of a spring schedule of prices, announced a week ago, serves to illustrate one of those cases where reduction fails to reduce. This results from a failure on the part of the transportation companies to reduce tolls simultaneously to correspond with the reduction in prices per ton. The position meanwhile is practical stagnation, buyers and sellers alike hesitating so long as the toll question is pending. Confidence is expressed that by April 1 a definite understanding will be reached by all parties. The Hard Coal men last week accepted prices substantially the same as those previously named for Free Burning, so that quotations are uniform. The figures for different periods, therefore, compare as follows:

	Broken.	Egg.	Stove.	Chest.
Winter circular	\$3.95	\$4.30	\$4.65	\$4.65
Present	3.75	3.90	4.15	4.00
	20	40	50	65

The Lehigh Valley and Lehigh Coal and Navigation companies and the Reading agreed upon the following at the mines: Broken and Egg, \$2.35; Stove, \$2.60, and Chestnut, \$2.40. The spring prices last year were: Broken and Egg, \$2.50; Stove, \$2.75, and Chestnut, \$2.60, while the winter prices for the season of 1888-89 were \$2.65 for Broken and Egg, \$2.90 for Stove, and \$2.75 for Chestnut.

The lowest rates quoted of individual Coal are: Stove, \$4.25; Chestnut, \$4, alongside. Production at the mines for the week ending March 16 is 514,457 tons, an increase of 28,705 tons compared with the previous week, and an increase of 174,000 tons compared with the same week in 1888. Since January 1 the increase is 489,000 tons compared with the corresponding date last year.

The Seaboard Association agreed to the following schedule, which is now in effect: F.o.b. at Philadelphia, Norfolk, Newport News, Baltimore and Georgetown, \$2.60 per ton of 2240 lb; f.o.b. at South Amboy, Perth Amboy, Weehawken, Hoboken and Port Liberty, for shipments to points outside of the harbor of New York, and also destined to points on the Hudson River north of Fifty-seventh street, and to points on the East River east of Hell Gate, \$3.15 per ton; f.o.b. at Elizabethport and Port Johnson for shipments to points on the Hudson River north of Fifty-seventh street and to points on the East River east of Hell Gate, \$3.05 per ton; f.o.b. at South Amboy, Perth Amboy, Elizabethport, Port Johnson, Weehawken, Hoboken and Port Liberty, for shipments to points on the North River south of Fifty-seventh street and to points on the East River west of Hell Gate, \$3.25 per ton, but all sales made as delivered alongside in the harbor of New York, south of Fifty-seventh street, North River, and on the East River west of Hell Gate, shall not be less than \$3.50 per ton of 2240 lb so delivered. We present details con-

cerning the organization of the association editorially.

The case of Cox Brothers & Co. against the Lehigh Valley Railroad is being heard before the commission at Washington.

Financial.

Little improvement is yet visible in general trade, as there are too many disturbing influences. Still, the distributive movement is spoken of as satisfactory in most departments, favored by mild weather and facilities for transportation remarkably good for this early date in the season. The Hudson River is open to Albany, and heavy freights will soon be moving on the canals. In the coal regions the canals were opened last week, the earliest day on record. The clearings of 40 cities for the week ended March 16 were \$1,056,524,425, compared with \$689,278,657 for the corresponding period (blizzard week) last year. The percentage of increase this year was 54.4 %. Outside of New York the gain was 28.6. New York increased 75.6, Boston 33.1, and Philadelphia 46.4 %. As concerns the crops, favorable reports are received from the Weather Bureau. In the Northwest the season is declared to be from one to three weeks in advance. The most demoralizing feature within the last few days is the financial situation in Paris, growing out of the threatened dissolution of the copper syndicate. All speculative articles were more or less affected. Wheat, previously declining, took another downward turn and breadstuffs weakened in sympathy. Cotton dropped to some extent. Provision traders find a free outlet for their hog products, but prices were weak owing to large receipts. Business in dry goods was more active than before this season, although the spirit of trade and the volume of transactions were scarcely up to expectations. The strike in Fall River gave a firmer tone to cotton goods. Grocers had a fair business, with sugar tending higher. The acceptance by Commissioner Walker of the chairmanship of the Western Railroad Association was well received, but the renewed cutting of rates by several roads served to neutralize any favorable indications, and prompted Judge Cooley to remark that offenders must suffer where the law has been violated. The Interstate Commerce Commission discussed the subject of making through export rates to the disadvantage of New York and adjourned for two weeks.

The Stock Exchange markets were unsettled and toward the close of the week there was heavy selling on reports of the suspension of the Société des Métaux and of the placing of the Comptoir d'Escompte in the hands of a liquidator. The week opened with lower coal stocks, following the reduction in the prices of coal. Another drop took place on Friday, influenced by fear of trouble between Austria and Serbia, and news of the engagement of gold for export to Europe. Saturday's bank statement had no unfavorable influences. The selling of St. Paul, Lake Shore and other stocks was followed by reaction. On Monday Boston houses sold very freely, and there were but few exceptions to the general depression. On Tuesday prices fluctuated widely, closing with a small gain in the general list. The Chicago, Burlington and Quincy's annual report proved more unfavorable than was expected. The results for the year are a net loss of \$8,000,000. Though neither the fixed charges nor any dividend was earned, 5 per cent. was paid.

The weekly bank statement shows a loss of \$477,425 in surplus reserve, which item now stands at \$3,068,435. This loss was due to the expansion of loans to the

amount of \$3,335,000. Deposits increased \$3,914,100. The increasing demand for accommodation and the indisposition of banks and trust companies to loan except to regular customers suggests the probability of firmer money for some weeks to come, especially in anticipation of the April settlements, unless the Treasury should purchase bonds in much larger amounts. Commercial paper is firmer at $4\frac{1}{2}$ @ $4\frac{1}{2}$ % for 60 @ 90 days indorsed bills; $4\frac{1}{2}$ @ $5\frac{1}{2}$ % for four months; longer dates, $5\frac{1}{2}$ @ $6\frac{1}{2}$ %.

United States bonds are quoted as follows:

U. S. 4 $\frac{1}{2}$ %, 1891, registered.....	107 $\frac{3}{4}$
U. S. 4 $\frac{1}{2}$ %, 1891, coupon.....	107 $\frac{3}{4}$
U. S. 4%, 1907, registered.....	128 $\frac{1}{2}$
U. S. 4%, 1907, coupon.....	129 $\frac{1}{2}$
U. S. currency 6s.....	120

A syndicate is said to have purchased \$30,000,000 worth of Government bonds, which, it is believed, the Secretary of the Treasury will take during April. It is stated that the five railroads controlled by the Poughkeepsie Bridge syndicate will all be merged into one company, with a capital of \$8,000,000. Charles H. Worth & Co., Boston pork packers, are reported to have made an assignment, with \$750,000 liabilities.

The market for sterling was not in the least influenced by the news from Paris, and it is probable that it will not be materially affected if the Comptoir d'Escompte should be sustained. Still, with discounts in London at the bank minimum and sight sterling so close to the gold exporting point, there is a possibility of gold shipments as an exchange operation. With reference to events in Paris, a member of the house of J. & W. Seligman & Co., which until recently had financial relations with the syndicate, is reported as saying that not even the wealth of the Rothschilds could sustain the syndicate on the present plan of operations for two or three years. The most suitable course would be to get rid of its 120,000 or more tons of copper in a way that would cause the least disturbance. Sterling is firm at \$4.86 $\frac{1}{2}$ @ \$4.89 $\frac{1}{2}$.

The imports of merchandise at this port during the week were \$9,925,486, of which \$2,860,000 represent dry goods. Since January 1 the aggregate is \$111,542,000, against \$107,240,000 for the same time last year and \$99,843,000 in 1887.

The exports of specie from this port last week amounted to \$2,113,250, making a total since January 1 of \$8,486,000, as compared with \$5,985,000 for the same time in 1888.

The Bureau of Statistics reports of exports for February show a decrease of about \$1,800,000 as compared with the exports for February, 1888. There is a decrease of about \$10,000,000 for the eight months ending February 28 as compared with the corresponding eight months of last year, but for the first two months of the present calendar year there is an increase of about \$600,000. The exports of corn for February show an increase of about \$2,000,000, of oats an increase of \$500,000, of wheat a decrease of \$700,000, and of wheat flour a decrease of about \$1,200,000.

The shipments of petroleum for the week were exceedingly large, aggregating 4,965,928 gallons, making a total since January 1 of 25,762,810, as compared with 19,113,666 gallons shipped during the corresponding period of last year. Latest advices from Hong Kong say that Russian kerosene oil is not wanted even at \$2 per case, while American oil has been taken freely at \$2.30 @ \$2.50.

The Harvey Steel Works, at Newark, N. J., a new concern which was built to work on the Harvey patents, began rolling yesterday.

Metal Market.

Copper.—The failure of the Société des Métaux, of Paris, and its inability to carry out the contracts it concluded with Copper mining companies in this country and elsewhere, have radically changed the position of the metal in the leading markets of the world and all the producing countries. To judge from the cablegrams received from Paris and London, all is confusion for the moment and in a state of transition, so that it will not unlikely take several days ere it is known what will be done with the Copper on hand for accounts of the defunct syndicate on both sides of the Atlantic, or part of it, and whether all the bankers' guarantees on now repudiated contracts will hold good. The solution of these questions, which cannot be obtained in a day or two, nor in the course of several weeks, probably, and the action of *bona fide* consumers in the meantime will determine the price of Copper thenceforward, surrendered once more to the legitimate influences of the demand and supply, and, after continued fluctuations, the metal will then settle down to greater steadiness. For any bankers or groups of bankers to attempt exercising a control is a matter not deserving consideration of a serious kind, we should say, after the experience of the past 18 months. The demoralization is too deep-seated and widespread, and nothing but legitimate commercial influences can restore a rational equilibrium. Last year we had the experience with Tin, which declined in the early summer to £75, in order to gradually recover a figure which was still low enough to allow consumption to take hold of the metal for legitimate wants. Speculation then has a chance to assist in regulating the price. When we last reported the price of Copper in London was £51; last night it was £40, spot, and £38, futures, and closed to-day at £39 @ £40 for Chili Bars, spot. Quotations here have been too ridiculously wide apart to serve as a criterion of the state of affairs; hence they may be looked upon as entirely nominal. We discuss the situation editorially.

Lead.—Has been dull and weak, 400 tons being sold at 8.70¢, at which it closes nominally, as there are no more buyers thereat. The Western quotation is 3.50¢ @ 3.55¢, with a rather confident feeling as regards impending spring developments.

Spelter.—The recent weakness and decline to $4\frac{1}{2}$ ¢ Common Domestic has provoked a better spot and future demand, so that the price named could not be shaded toward the close. An early spring opening would benefit the metal materially.

Antimony.—A steady jobbing trade has been going on at 12¢ for Hallett, and 13 $\frac{1}{2}$ ¢ for Cookson.

Tin.—At the time of our last report spot Straits commanded £94. 10/, and futures £95. 7/8; they stood respectively £98. 5/ and £94. 10/ yesterday, with sales of 450 tons in the meantime. After settling down to a more quiet tone, sales were made in this market at 20.95¢ @ 21.05¢ for 50 tons May, 10 tons June at 21.20¢, and 20 tons July at 21¢ @ 21.20¢. Yesterday 20.90¢ was bid for spot, March and May, and 20.95¢ for April, with sellers at 20.20¢ for spot and March, and 21¢ @ 21.05¢ for April and May. Spot Tin closes at 21 $\frac{1}{2}$ ¢ to-day. **Tin Plates.**—While the English market has continued firmly sustained, business here has been on a restricted scale merely. The following are the closing quotations, in large lines, 3 box: Liverpool quotes Coke 13/ @ 13/3; Siemens-Martin Steel, Charcoal finish, \$4.75 @ \$5.50; Terns, \$4.12

@ \$4.25; Coke Tins, \$4.22½ @ \$4.30, and Wasters \$4.12½ @ \$4.15.

New York Metal Exchange.

The annual report of the New York Metal Exchange shows that the receipts were \$12,418.07, while the disbursements were \$11,815.78. The invested property of the concern is valued at \$55,538.52, which includes the building with \$46,106.25. This property is equal to an average of \$165.30 on each certificate of membership outstanding.

The following sales are reported:

THURSDAY, March 14.	
10 tons Tin, April.....	21.20¢
128 tons Lead, April.....	3.77½¢
100 tons Lead, August.....	3.87½¢
100 tons Lead, spot.....	3.75¢
FRIDAY, March 15.	
16 tons Lead, May.....	3.77½¢
28,000 pounds G. M. Copper, March.....	14.00¢
SATURDAY, March 16.	
48 tons Lead, spot.....	3.72½¢
16 tons Lead, March.....	3.72½¢
16 tons Lead, May.....	3.75¢
96 tons Lead, September.....	3.85¢
MONDAY, March 18.	
10 tons Tin, June.....	21.20¢
10 tons Tin, July.....	21.20¢
10 tons Tin, May.....	20.95¢
10 tons Tin, July.....	21.00¢
TUESDAY, March 19.	
30 tons Tin, May.....	21.00¢
10 tons Tin, May.....	21.05¢

Imports.

Hardware, Machinery, &c.

Boker, Hermann & Co., Mdse., cs. 4; Arms, cs., 47
 Curley, J. & Bro., Cutlery, case, 1
 Corbiere, Fellows & Co., Mach'y, pkgs., 231
 Clark, G. A. & Bro., Mach'y, cs., 230
 Erie Desp. Co., Mach'y, pkgs., 10
 Field, Alfred & Co., Anvils, 176; Hwd., ck. 1
 Hartley & Graham, Arms, cs., 19
 Knauth, Nachod & Kuhne, Mach'y, cs., 4
 Lau, J. H. & Co., Arms, cs., 6
 New England Paper Co., Tub Mach'y, 1
 Reed, Holliday & Son, Mach'y, cs., 7
 Sacks & Richmond, Nails, cks., 20
 Schoverling, A., Arms, cs., 12
 Taylor, Thos., Mdse., cs., 5
 Western Electric Co., Electric Light Plant, pkgs., 9
 Width, N., Mach'y, cs., 3
 Wiebusch & Hilger, Lim., Mdse., cs., 27; Arms, cs., 5
 Witte, John G. & Bro., Cutlery, cs., 9
 Order, Mach'y, cs., 76

British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, March 20, 1889.

The situation of the Copper market is still chaotic. The Comptoir D'Escompte has secured an advance of 40,000,000 francs from the Rothschilds and others, but even this fails to clear up the uncertainty in regard to the signature of that institution given in connection with contracts between the syndicate and the mines. It is certain, however, that nothing decisive will be undertaken before the American delegates arrive, on this matter or with respect to any new combination. Their assent is essential to the conclusion of an effective agreement. The Société des Métaux was unable to meet engagements Monday, and brokers, in order to protect themselves, sold at any price they could obtain. One transaction in Bars was made at £35. Brokers formerly employed by the syndicate have ceased taking up Bars delivered on contracts and are unlikely to make purchases. The collapse of the syndicate is, in fact, generally believed to be final. Since Monday the open market has displayed more firmness under the stimulus of improved demand; prompts sold at £39 @ £39. 10/, and futures subsequently moved up to £38 @ £39, at

which sales were reported of three months. Best Selected is £45 @ £46, nominal.

Block Tin was virtually neglected until within a few days and prices declined under the influence of the depression in Copper. The demand has increased the last few days, particularly for consumption, and prices have improved. Straits shipments the first half of March to England and America were 860 tons.

Speculation in Pig Iron warrants has been large and influenced in a degree by the collapse in Copper, which induced free selling. The consumptive demand is steadily increasing, and this fact, together with a marked decrease in the stocks, has caused firmer prices again. Additional furnaces are blowing in. Some brands of Scotch are again higher, and Middlesboro' Pig is 6d up, but Hematites have been sold at a slight reaction from the highest figures.

In Tin Plate there has been a large American business at 6d advance on previous purchases. Inquiries and orders are increasing daily, and prices continue to harden.

Old Iron is held at somewhat higher prices, owing to the firmness of the general market, but the demand is not brisk. America is buying little.

Present high prices tend to restrict business in the Steel department to some extent, and except in Rails and shipbuilding sorts the trade is only fair at present. Makers have not changed their prices for Iron Bars, Sheets, &c., but report a strong and fairly active market.

Scotch Pig—Prices are maintained throughout, the market continuing active:

No. 1 Coltness, f.o.b. Glasgow	55/6
No. 1 Summerlee, " "	55/
No. 1 Gartsherrie, " "	55/
No. 1 Langloan, " "	55/6
No. 1 Carnbroe, " "	46/
No. 1 Shotts, " at Leith	55/6
No. 1 Glengarnock, " Ardrossan	50/6
No. 1 Dalmellington, " "	45/6
No. 1 Eglinton, " "	44/6

Steamer freights, Glasgow to New York, 5/ Liverpool to New York, 10/.

Cleveland Pig.—There has been a continued brisk trade, and prices are strong. No. 1 Middlesboro', G.M.B., 39/6; No. 3 ditto, 37/6.

Bessemer Pig.—A large business has been done, but at slightly lower prices. West Coast brands, mixed numbers, 47/6, f.o.b. shipping point.

Spiegeleisen.—The demand is fair and prices remain firm. English 20 % quoted 80/, f. o. b. N. W. England shipping point.

Steel Rails.—The market continues strong and the demand fairly active. Heavy sections quoted at £4. 7/6, and light sections £4. 15/ @ £4. 17/6, f.o.b. at N. W. England shipping point.

Steel Blooms.—There is a good demand for these and prices are firm. We quote £3. 19/3 for 7 x 7, f.o.b. at N. W. England shipping point.

Steel Billets.—Only a fair trade reported, but sellers very firm. Bessemer, 2½ x 2½ inch, £4. 6/3, f.o.b. at N. W. England shipping point.

Steel Slabs.—The demand moderate and prices a shade easier. Bessemer £4. f.o.b. at N. W. England shipping point.

Old Rails.—Business moderate and buyers and sellers apart. Tees quoted at £3. 5/ @ £3. 7/6, and Double Heads, £3. 7/6 @ £3. 10/, c.i.f., New York.

Scrap Iron.—Sellers are firm, but only a moderate business passing. Heavy Wrought quoted at £2. 2/6 @ £2. 5/, f.o.b.

Crop Ends.—Small sales making at previous prices. Bessemer quoted £2. 10/ @ £2. 12/6, f.o.b.

Tin Plate.—Transactions have further increased and the market continues strong. We quote, f.o.b. Liverpool:

1C Charcoal, Allaway grade.....	15/3 @ 15/9
1C Bessemer Steel, Coke finish.....	13/9 @ 14/
1C Siemens.....	14/ @ 14/3
1C Coke, B. V. grade.....	13/3 @ —
Charcoal Terne, Dean grade.....	12/6 @ 13/

Copper.—Market still unsettled, but closing firmer. The quoted prices at the close were: Bars, £39. 10/ @ £40 for spot; £38 @ £39, nominal, for three months' futures. Best Selected, £45 @ £46, nominal.

Manufactured Iron.—There continues to be a good trade in this branch at steady prices. We quote, f.o.b. Liverpool:

	£ s. d.	£ s. d.
Staff. Ord. Marked Bars.....	@ 8 2 6	
Common.....	@ 5 12 6	
Staff. Bl'k Sheet, singles.....	7 12 6 @	
Welsh Bars (f.o.b. Wales).....	5 2 6 @ 5 5 0	

Tin.—The market rather slow, buyers and sellers apart. Straits quoted at £94 @ £94. 5/, spot, and £94. 15/ @ £95 for three months' futures.

Lead.—Very little doing, but prices steady. Quoted at £12. 10/ for Soft Spanish.

Spelter.—The demand moderate, but prices steady. Quoted at £17. 5/ for ordinary Silesian.

Foreign Markets.

EQUIVALENTS.

	Cents.
Franc, Peseta or Lira.....	19.3
Florin (Netherlands).....	40.2
Florin (Austria).....	35.9
Wlirels (Portugal).....	11.08
Wlirels (Brazil).....	54.6
Mark (Germany).....	33.5
Pounds.....	2.306
Kilogram.....	134.
Picul.....	134.

CHILL.

VALPARAISO, January 18, 1889.—Copper.—During the fortnight under review sales were made on the spot to the extent of 18,204 quintals at \$25.86 @ \$26.40 per quintal. Then the official cable quotations from London were still £98 or thereabout. The same, however, inspires no confidence, exporters being afraid of French financial affairs; so that nothing could be sold now except at a material decline. Coal.—Newcastle has been paid 40/ @ 41/ on the spot, while for distant floats 42/6 @ 45/ is asked, but there is no disposition to pay such a price. Exchange.—90 days' sight on London may be quoted 24½d. —Weber & Co.

BELGIUM.

BRUSSELS, March 9, 1889.—Iron.—The Belgian Iron market has been firmly sustained during the week. Current production of our works is moving off steadily, the higher figures being submitted to quite readily. As for the foundry branch, it should be mentioned that the export trade leaves a good deal to be wished for, but this is compensated for by an all the greater domestic demand. Old Iron, having also risen in price, is about the best indication that raw material remains scarce and wanted. Following are the quotations to-day in francs & kg: Foundry, 4.85 @ 6.30; Forge Pig, 4.70 @ 5.80; Merchant No. 1, 12.50 at Belgian stations; 12 f.o.b. at Antwerp; Beams at Belgian stations, 12; f.o.b. at Antwerp, 11.75; Angles, respectively 13.50 and 13; do for Vessels, 14.25; Sheets, No. 2, 15.50; do Steel, 18. It should be added that Thyle-Château has sold some Beams at 12 @ 12.10, f.o.b. at Antwerp, which shows the tendency of the market.—*Moniteur des Intérêts Matériaux.*

GERMANY.

HAMBURG, March 9, 1889.—Iron.—Advices from the Rhenish Westphalian Iron market continue reassuring. Great firmness prevails, there being no abatement in the demand. Pig Iron has been lively at stiff prices, especially as regards Spiegel, firmly held as heretofore at 63 marks per ton. The rolling mills absorbing increased amounts of Forge Pig; the latter is as well sustained as ever at 53 @ 54, while Foundry Pig is unaltered. Thomas is in lively request at 45; Bessemer is still rather dull; English at 46; White Luxembourg is worth 35 @ 37 marks and Gray 44 @ 46. Germany produced last year 4,229,484 tons of Iron, against 3,977,341 in 1887. Of this amount, 2,064,060 tons were Forge Pig and Spiegel; 395,873 Bessemer; 1,253,873 Thomas, and 516,232 Foundry

Fig. Merchant Iron continues doing tolerably well for domestic use, although the margin made is moderate; for export the trade therein still flags; all other Finished Iron is doing remarkably well. The demand revives for Wire products likewise. Foundries, machine shops and car-making establishments all prosper. We quote Wire Rods, 120 @ 125; Steel Rails, 120 @ 122, and ditto. for Mines, 110 @ 115.—*Borsenhalle.*

EAST INDIES.

MANILA, March 11.—*Hemp.*—Our market has been quiet at \$16.25 per picul, against \$7.78 1/2 same date last year, equaling 1/2 ton, cost and freight, £52. 12/6, against £28. 15/. There cleared for the United States since last cable 7000 bales, against none last year, and since January 1 32,000, against 30,000; there remained loading for ditto 17,000, against 8000. Cleared for England since January 1, 61,000 bales, against 61,000 bales; loading for ditto, 4000, against 35,000; cleared for all other ports, 7000, against 13,000; receipts at all other ports since last cable, 12,000, against 10,000, and since January 1, 131,000, against 113,000 last year and 85,000 in 1887. Freight.—\$7.50, against \$5. Exchange, 6 months' sight, 3/7 1/2, against 3/3 1/2.—*Kerr & Co., per cable direct, to Mr. Charles Nordhaus, New York.*

COLOMBO, January 31, 1889.—*Plumbago.*—A moderate amount of activity has prevailed at following quotations, in rupees, per ton: Large Lumps, 145 @ 170; Ordinary Lumps, 125 @ 160; Chips, 80 @ 95; Dust, 40 @ 65. *Coir Yarn.*—No. 1 to 4 may be quoted 7 @ 12 rupees per cwt. Following are the shipments of *Plumbago* since October 1: To England, 28,280 cwt.; to Hamburg, 4419; to Antwerp, 2806; to Bremen, 456; to India, 21; to Australia, 88, and to the United States, 35,088; together, 71,108, against 104,223 in 1888; 83,072 in 1887 and 64,550 in 1886. Exchange.—We quote 6 months' sight 1 1/2-16d.—*Walker Brothers, through their agent, Mr. John W. Greene, New York.*

PENANG, February 15, 1889.—*Tin.*—Receipts for the fortnight amounted to 10,500 piculs, of which Europeans took 8000, while Chinese bought the balance and 1500 piculs besides. The market opened at \$36.50 per picul, advancing yesterday to \$37.40, but to-day there are no buyers.—*Schmidt, Kustermann & Co.*

HOLLAND.

ROTTERDAM, March 7, 1889.—*Tin.*—Since the beginning of the month but a light trade has been done, at \$7.75 @ 58 Banca, spot; Billiton, do. at 50 @ 57.50, and the latter to arrive 57.50 @ 57.75. The following statement shows the position of Banca Tin in Holland on February 23, from the official returns published by the Dutch Trading Company:

	1889.	1888.	1887.
Import in February, slabs.....	11,700	13,001	13,171
Total, two months, slabs.....	26,700	36,400	25,670
Deliveries in February, slabs.....	12,780	5,500	12,260
Total, two months, slabs.....	21,740	10,700	27,155
Stock, second hand, slabs.....	29,150	30,809	18,526
Unsold stock, slabs.....	141,071	86,746	56,595
Total stock.....	170,221	117,555	75,121
Afloat, piculs.....	4,600	6,400	3,500

Statement of Billiton:

	1889.	1888.	1887.
Import in February, slabs.....	1,940	18,523	7,400
Total, two months, slabs.....	5,238	24,023	18,737
Deliveries in February, slabs.....	7,205	2,900	7,363
Total, two months, slabs.....	11,740	9,933	15,433
Stock, slabs.....	12,798	30,218	25,925
Afloat, piculs.....	27,500	20,500	16,500
Quotation, February 23—Banca.....	f 58	f 108	f 61 1/4
Billiton.....	f 58	f 100	f 61

—*De Monchy & Havelaar.*

The annual meeting of the stockholders of the Virginia Coal and Iron Company was held at the Exchange Hotel, Richmond, Va., on Tuesday, the 12th inst. The company own about 65,000 acres of valuable coal lands in Wise County, immediately north of Big Stone Gap, and large tracts of iron land in Scott and Lee counties. The following are among the stockholders and officers of the company: E. B. Leisenring, Dr. J. S. Wentz, S. B. Price, A. W. Leisenring, Daniel Bertch and M. S. Kemmerer, Mauch Chunk, Pa.; Dr. George Wentz, Jeddo, Pa.; Samuel Thomas, Catasauqua, Pa.; T. A. Dodson, George H. Myers, Bethlehem, Pa.; W. W. Watson, Scranton, Pa.; G. W. Mullin and J. O. Tomblor, Philadelphia.

The Ellis & Lessig Steel and Iron Company, of Pottstown, Pa., manufacturers of cut nails, have broken ground for 12 additional puddling furnaces. The contract for the castings, amounting to about 150 tons, has been given to the Colebrookdale Iron Company, of Pottstown.

The Reading Settlement.

The following is the full text of the plan of the settlement of the Reading Iron Company:

It will not be practicable to make any cash payment if the works are to be kept going and the business continued. The company will have no credit and cannot therefore borrow working capital; the values represented by merchandise, stock and materials will be required in the future conduct of the business. The depreciation in the value of the plant in the event of liquidation will be so great that the creditors will be better off to reorganize the company and keep it a "going concern" under prudent and economical management than to convert the personal property into cash and distribute the proceeds. The practical questions, therefore, are to devise measures to give the creditors the best possible securities, to enable them to maintain their credit and carry the notes discounted in bank, to enable them to realize the largest possible amount on their claims.

The real estate and plant are valued on the books at \$1,838,050.58 as a "going concern." They have been appraised by the creditors' committee at \$1,558,450, but if sold under liquidation would bring very little in excess of liens.

There is a mortgage of \$600,000, 6 per cent., 80 years, on the plant. If the whole debt, say \$1,300,000, were funded in a second mortgage, the bonds would command a low price. It will be better to issue, say, 40 per cent. of second mortgage 6 per cent. bonds, and a third mortgage of 60 per cent., \$780,000, interest payable if earned at the rate of 6 per cent., with a sinking fund into which surplus net earnings shall be paid.

Settle and adjust with all creditors whose claims are less than \$1000 by the payment of 60 per cent. cash. This will reduce floating debt to \$1,300,000.

Adjust this \$1,300,000 by 40 per cent., second mortgage bonds, 6 per cent. \$520,000, and 60 per cent., third mortgage, \$780,000. The third mortgage bonds to be entitled to 6 per cent, if earned, and all net earnings after the payment of fixed charges and interest on third mortgage.

(A) Interest on first mortgage.....	\$38,000
(B) Sinking fund first mortgage.....	9,000
(C) Interest on second mortgage.....	31,200
(D) Interest on third mortgage.....	46,800

Total \$123,000, to be paid into the sinking fund of third mortgage, to be invested by trustee of the mortgage in purchase of third mortgage bonds at market price, not exceeding par, and with usual sinking-fund clauses regulating investment. If bonds can be purchased cancel common stock and issue deferred stock, cancel preferred stock and issue common stock in lieu.

The holders of deferred stock to deposit their stock with the trustee of third mortgage, with voting power to said trustee. The trustee to vote the stock as requested by a majority of holders of second and third mortgage bonds.

NOTE.—In lieu of third mortgage 5 per cent. perfection stock could be issued, but the third mortgage is the better security and will be more acceptable as a collateral.

A new catalogue of the E. W. Bliss Company, Brooklyn, has just made its appearance. This is the eighth edition put out by this firm and in many respects is an improvement over anything that has preceded it. Folded plates are avoided, and yet the various machines are shown in a way to meet every requirement. The volume in size measures 5 x 7 1/4 inches. It is bound in cloth with gilt side and back titles, with embossed monogram on the last page of cover. It contains no less than 263 pages. The engravings are clear and distinct; the letter-press is terse and

appropriate, and the price lists are arranged in such a form as to afford every necessary feature of information. Many new tools and machines are shown, and the sheet-metal worker will find it difficult to secure so much information in compact form in any other direction as is shown in this book, and yet the list of illustrations is by no means exhaustive. One thing to be specially noticed is the advance being made in the designing of machinery. Types of presses which have been familiar to the manufacturing public for many years past are no longer seen in this volume. Instead new styles and designs have taken their places, of better construction and greater convenience, indicating that this establishment is keenly alive to the rapid advance of the day, and is keeping its friends and customers in the front ranks of progress. The volume is one that should have large circulation and should be preserved for reference in the library of every mechanic and manufacturer.

Business Methods.

The form of remittance which was published in our issue of January 17 has called out an interesting letter from the firm of E. D. Ransom & Co., dealers in molding sand, foundry facings and founders' supplies, at Albany, N. Y. In it they inclose a form of remittance which they are employing and which they state is very convenient for the purpose. With the exception of an ornamental corner-piece the form is as follows, the blank spaces being filled in to show its practical utility:

ALBANY, N. Y., February 23, 1889.

Messrs. Jones & Co.

Dear Sirs:

We inclose Check No. 2730, for four hundred dollars, in settlement of account as below. Please acknowledge same.

Yours truly,

E. D. RANSOM & Co.

'89.

Dec.	29	Mdse.	\$200 00 300 00	\$500 00
Jan.	10 20	Cr. Allowance. Frt. and Dis.	50 00 50 00	100 00
				\$400 00
		(Receipt and Return.)		

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Received of E. D. RANSOM & Co.,

.....Dollars,
in settlement of account as above.
\$.....

The lines at the bottom are to be filled in by the persons receiving the money, their signature attached in proper place, and the entire form then returned to those making the payment.

Clark Bros., Belmont, N. Y., announce that their machine shops and foundry were destroyed by fire Saturday evening, the 16th inst. Their patterns, drawings, jigs, templates, special tools and a large quantity of their stock in process of construction was saved from the fire, and they have made arrangements temporarily for occupying and carrying on their business at the large foundry and machine shop of the Rawson Mfg. Company, which is referred to as splendidly equipped with all necessary machinery and tools, so that they can fill all orders promptly.

A patent has just been granted to James A. Burden, of Troy, on a magnetic ore separator.

Hardware.

The trade for the past week has not been up to expectations, and some complaint is made by merchants and manufacturers that goods are being purchased in comparatively small quantities, the trade throughout the country manifesting a disposition to defer their orders. The volume of business is, however, fair, and it is expected that with the progress of the season there will be a satisfactory trade. Prices remain substantially unchanged.

Barb Wire.

The New York market presents no new features of importance, the demand being only fair, but prices are without change.

The recent circular of Washburn & Moen Mfg. Company and I. L. Ellwood & Co. refers at some length to Barb Wire litigation. With reference to its general features they say:

We desire the trade to understand distinctly that, with three or four exceptions, every Barbed Fence Wire manufacturer in the United States, between 40 and 50 in number, are our licensees, the infringers being all under suit. Practically but one decision has been rendered against us by a United States District Judge—in the northern part of Iowa, an appeal from which was promptly taken to the Supreme Court of the United States—and concerns but a limited portion of a single State, where no unlicensed Wire is now being manufactured. Again, this decision concerns but one patent out of the 250 odd which we own on Barbed Wire and the machinery for making same. That decision, moreover, was rendered some 13 months ago, where, but two months since, we had no difficulty in obtaining an injunction in the United States Court against certain parties in Joliet, of this State, to restrain them from manufacturing Glidden Wire, which they had not been authorized by us to manufacture.

Referring to their litigation with the Braddock Wire Company and the St. Louis Wire Mill Company and parties handling unlicensed Wire, the circular says:

In May, 1888, we filed a bill for an infringement of our patents, among which was the principal Glidden patent, sustained by Judge Brewer against the Braddock Wire Company. The defendants interposed delays and refused to answer until October 1, 1888. In October and November, 1888, we took our entire testimony, 165 printed pages, and filed the same on record, and since that time the Braddock Wire Company has not taken a line of testimony or made a single defense, and an injunction and decree will go against them by default at the next term of that court unless they now beg leave of court so to do. The record of the United States Court at Pittsburgh will show this fact.

In April, 1888, we filed a bill against the St. Louis Wire Mill Company, in the United States Circuit Court for the Southern District of Illinois, for an infringement of the Glidden patent, heretofore sustained by Circuit Judge Brewer, and being the patent referred to by District Judge Shiras. The St. Louis Wire Mill Company filed answer in May in that case, and also filed a lot of affidavits, alleging the great damage to their business by suits brought by us on the Glidden patent, and letters and circulars written by us, and asking for an injunction against us restraining the bringing of suits, writing letters, issuing circulars, &c., against infringing dealers and consumers of Barbed Wire. Of course this injunction was not granted. In July and August, 1888, we took extensive testimony and closed our proof in that case. Not a line of testimony has been taken by the St. Louis Wire Mill Company, or a defense put in in that case either; we shall obtain an injunction and decree against the St. Louis Company at the next term of court unless the company by pleading and begging and affidavits obtain the time to put in some defense.

In addition to the number of suits which we are prosecuting as vigorously as the law will allow against the very few parties who are venturing to manufacture unlicensed Barbed Wire, we have recently instituted suits against the Van Camp Hardware and Iron Company, Indianapolis, Ind.; Low & Woodruff, Chicago agents for the Braddock Wire Company; The Hazen Company, Cincinnati agents for the same company; Pappenheimer Hardware Company, jobbers at Cincinnati, who are selling the same make, and are collecting evidence against a number of jobbers and dealers, which, when completed, will lead to suits.

Wire Nails.

There is a fair amount of business in Standard Wire Nails, which are coming into constantly increasing use. The extreme prices which are made are unquestionably below cost, and some of the manufacturers are refusing to meet them.

Cut Nails.

While the volume of business continues quite satisfactory in Cut Nails, prices are still somewhat unsettled and decidedly unremunerative. We continue to quote standard quality Iron Nails, carload lots; \$1.80 to \$1.85, and small lots, \$1.90 to \$1.95.

The regular monthly meeting of the Western Cut Nail Manufacturers' Association was held in the office of the Benwood Iron Works, Wheeling, W. Va., on Wednesday, the 13th inst., about one-half of the firms being represented. Nothing but routine business was transacted. No change was made in the card rate.

Clothes Wringers.

The manufacturers of Clothes Wringers have adopted a new list, which is given below. It will be observed that this list is not now printed \$2.50 or \$3 per dozen higher than the price of the goods to the trade, as heretofore, but that it is printed net 60 days, subject to 2 per cent. discount for cash in 10 days. This change will commend itself to the convenience and judgment of the trade. Change has also been made in the matter of freights and deliveries, by which buyers of jobbing quantities will receive an allowance on

Names and numbers.	Size of roll.		Wholesale prices, per dozen.
	Length, inches.	Diam., inches.	
Superior Wringers, Iron Frame and Steel Springs:			
No. 2, Small Family Size....	10	1 1/4	\$18.50
No. 3, Medium Family Size....	11	1 1/2	23.00
No. 4, Large Family Size....	12	1 3/4	28.00
Novelty Wringers, with Curved Clamp:			
No. 2 1/2, Small Family Size....	10	1 1/4	23.50
No. 3 1/2, Medium Family Size....	11	1 1/2	28.00
No. 4 1/2, Large Family Size....	12	1 3/4	33.00
No. 2 3/4, Large Family Size....	10	2	38.00
No. 3 3/4, Ex. Large Family Size....	11	2	42.00
No. 4 3/4, Small Hotel Size....	12	2	52.00
Novelty Wringers, with Straight Clamp:			
No. 2 1/2, Small Family Size....	10	1 1/4	23.50
No. 3 1/2, Medium Family Size....	11	1 1/2	28.00
No. 4 1/2, Large Family Size....	12	1 3/4	33.00
No. 2 3/4, Large Family Size....	10	2	38.00
No. 3 3/4, Ex. Large Family Size....	11	2	42.00
No. 4 3/4, Small Hotel Size....	12	2	52.00
Novelty Wringers, New Style:			
No. 10, Small Family Size....	10	1 1/4	23.50
No. 11, Medium Family Size....	11	1 1/2	28.00
No. 12, Large Family Size....	12	1 3/4	33.00
Excelsior Wringers, with Folding Bench:			
No. A, Small Family Size....	10	1 1/4	42.50
No. B, Medium Family Size....	11	1 1/2	47.00
No. C, Large Family Size....	12	1 3/4	52.00
No. AA, Large Family Size....	10	2	52.00
No. BB, Ex. Large Family Size....	11	2	62.00
No. CC, Small Hotel Size....	12	2	71.00
Excelsior Wringers, for Stationary Tube:			
No. E, Small Family Size....	10	1 1/4	38.50
No. F, Medium Family Size....	11	1 1/2	38.00
No. G, Large Family Size....	12	1 3/4	43.00
No. EE, Large Family Size....	10	2	43.00
No. FF, Ex. Large Family Size....	11	2	52.00
No. GG, Small Hotel Size....	12	2	62.00
Excelsior Wringers, Laundry and Factory:			
No. H, Medium Hotel Size....	12	2 1/4	99.00
No. HH, Large Hotel Size....	14	2 1/2	126.00
No. JJ, Laundry or Factory....	16	3	261.00
No. KK, Laundry or Factory....	18	3 1/2	351.00
No. LL, Laundry or Factory....	14	4 1/2	441.00
No. MM, Laundry or Factory....	18	5 1/2	987.00

shipments to equalize freights with the factory nearest the purchaser to whom such allowance is made. By this arrangement a house in the West, for example, buying goods from an Eastern manufacturer will hereafter have to pay only what the freight would be from the Western factory located nearest to them, instead

of paying the freight from the Eastern factory, as formerly. The following are points covered by the arrangement in regard to the equalization of freights: Boston, Mass., Woonsocket, R. I., Middlefield, Conn., Auburn, N. Y., Philadelphia, Pa., Erie, Pa., Cleveland, Ohio, and Cincinnati, Ohio.

The change in list as made by the Empire Wringer Company, Auburn, N. Y., applies only to the Daisy and Volunteer Wringers, the Empire Wringers remaining at the same prices and terms as heretofore.

The foregoing is the revised price list of the Bailey Wringing Machine Company, Woonsocket, R. I., which represents also the list prices of other manufacturers. Terms, 60 days, 2 per cent. discount for cash in 10 days.

Items.

The American Buckle and Cartridge Company, West Haven, Conn., for whom the Alford & Berkele Company, 77 Chambers street, New York, are agents, have decided to go into the business of loading Shells and will be ready to deliver the goods about the middle of June or first of July next. This step is taken in view of the fact that the sale of loaded Shells is increasing, while the sale of unloaded Shells is correspondingly decreasing. We are advised that the company have ample facilities for this new departure, and with their I X L and special brands of Shells they are in a position to make this addition to their line in such a way as to meet the varied requirements of the trade.

Gibson, Parish & Co., dealers in Cabinet Hardware, who were recently burnt out at 78 and 80 Randolph street, Chicago, have established temporary quarters at 82 Lake street and re-engaged in business. They may return to their old location after the building is re-erected.

H. H. & C. L. Munger, 142 Lake street, Chicago, have increased the line of Fauber's Electric-Action Bells by adding 3 1/2-inch Plain Gong, nickel-plated, 3 1/2-inch Bell Metal Gong, nickel-plated, and 3 1/2-inch Bell Metal Gong, polished, which are numbered respectively, 081, 082 and 083.

The wholesale catalogue issued by Thos. H. Chubb, Post Mills, Vt., represents in attractive style his line of Fishing Tackle, special attention being given to Fishing Rods, the manufacture of which is made a specialty. Mr. Chubb alludes to his excellent facilities and his experience of 20 years in this business as putting him in a position to offer superior goods at favorable prices. The list represents a large variety of Rods, Reels, Flies, Hooks and miscellaneous Fishing Tackle specialties.

By an error, which from the prominent position occupied by the house was probably recognized by most of our readers, the location of the C. W. Hackett Hardware Company, successors to the Strong-Hackett Hardware Company, was in the paragraph in our last issue relating to the change in style, given as Minneapolis instead of St. Paul, Minn.

It will be observed that among the Special Notices on page 50 is one relating to a wholesale and retail Hardware business of 40 years' standing, in a centrally located city. The sales are given as \$300,000, the stock amounting to \$45,000.

The Eagle Pencil Company, 78 Franklin street, New York, issue circulars calling attention to some of their recent novelties. One of these is their Enigma Pencil, in which the lead takes its proper projection for writing whenever the point is turned downward, and on returning the Pencil to the pocket, point upward, the lead drops in automatically. As the lead wears off, by means of a knob at the end of the Pencil it is adjusted to the desired

length. A new lead can be inserted by unscrewing the tip and placing the lead in its carrier. They also issue a circular describing the Matchless Compass and Combined Pencil and Compass, so constructed that when not required for use it can be easily carried in the vest pocket, occupying no more room than the ordinary Lead Pencil, while at the same time the points are concealed, so that no damage may be done to the clothing. It is described as made of the best nickel, carefully manufactured and of superior finish.

On page 50 Haydock & Bissell, the Hardware Auctioneers, announce on March 26 and 27, an important sale of Table and Pocket Cutlery; on March 28 a large trade-sale of Hardware, and on March 29 a special sale of House-Furnishing Goods, Brushes, &c., at their rooms, 12 Murray street and 15 Park Place. Particulars in regard to this sale are given in their advertisement, and it will be seen that the opportunity is deserving the attention of buyers.

Geo. D. Winchell Mfg. Company, Cincinnati, Ohio, issue a circular showing their line of Imperial Water Coolers, the different patterns of which are illustrated with some new designs. The Gate City Stone Filter is also represented.

B. G. Farrar & Co., St. Louis, Mo., issue a circular relating to their patent Adjustable Buggy and Wagon Wrenches and Common Sense Buggy and Wagon Jacks, giving illustrations and list prices and pointing out their advantages.

In their advertisement on page 72 Peabody & Parks, Troy, N. Y., illustrate the Farmers' Favorite Potato Bug Exterminator, of which they are manufacturers. This machine is for dusting plaster, Paris green, phosphates, &c., and its simplicity, durability and satisfactory working are points made in regard to it.

The Cleveland Stone Company, Cleveland, Ohio, have been appointed agents by the Pike Mfg. Company, Pike Station, N. H., for the sale of their domestic and imported Scythe Stones, Washita, Arkansas, Hindostan and Turkey Oil Stones, &c., and have opened a branch office at 51 Chambers street, New York.

Bennett & Shirk, 112 and 114 Lake street, Chicago, selling managers of the North Star Refrigerators, manufactured by the Indiana Mfg. Company, of Peru, Ind., have just issued an illustrated and descriptive catalogue. Various styles of hardwood Refrigerators are shown, embracing small sized upright, large sized family or restaurant single door large sized double door, front door to ice chamber, four door, Sideboards, Sideboard and Cabinet combined, plain finished, and Ice Chests. The high-class Refrigerators are all finished in antique. The Sideboards are made of solid quartered oak, antique finish, or walnut, hand carved, inlaid with ebony and cherry, have embossed mosaic panels, beveled French plate mirrors, special water cooler, and complete in every other respect. All the upright Refrigerators are lined with felt throughout, including the lids. A recent test of one was made in a steam drying room heated to 165°. It was left there for eight hours, in which time two gallons of water were formed by the melting ice, and when taken out the inside temperature was 48°, which was a very creditable performance. It is claimed that in this Refrigerator perfect circulation of cold air is secured through the linings of the walls, as also through the linings of the doors and lids, in which suitable openings have been made.

James D. Frary, Meriden, Conn., is putting on the market a very interesting and complete line of Lemon Squeezers, Cork-

screws and other specialties. On page 453 of this issue a description is given of the Seaside Lemon Press and Strainer, a new article, to the convenience and efficiency of which attention is called. Emphasis is laid upon the fact that in Nos. 162 and 182 the parts of the press which come in contact with the lemon-juice, are lined with pure britannia metal. The catalogue exhibits an exceptionally complete line of Corkscrews, many of which are of new design and are combined with other tools, such as Can Openers, Picks, &c. Other specialties are also illustrated.

Hibbard, Spencer, Bartlett & Co., of Chicago, finding their present spacious quarters too small to accommodate their increasing business, have secured two additional buildings adjoining their stores on the east and will occupy them after the 1st of May. These buildings are each five stories high, 24 feet wide and 140 feet deep. The company's block will then be 160 feet long by 140 feet deep, leaving but one 24 foot building between it and an alley on the east. Their numbers on Lake street will run from 18 to 32 inclusive. This increased space will add greatly to the convenience of the firm. One of the new buildings will be used for their new Lamp Department, which will hereafter cover not only a full line of Lamps, but everything pertaining to the Lamp business. In the line of present trade the firm states that they are doing a large business thus early in the season in Ice-Cream Freezers. They handle the Lightning Freezer made by the Shepard Hardware Company, which was brought out late last year. They have also added to their stock the Jewett line of Filters, for which an active inquiry is developing in sections afflicted with impure water.

Walbridge & Co., Buffalo, N. Y., have issued a very convenient catalogue of Tinware and House-Furnishing Goods, of which they have made a judicious selection. Illustrations are given of leading goods and many specialties, the cuts being small, yet clear and satisfactory, and representing the goods attractively. The numbers, sizes, &c., of the different articles are given, but the list prices are omitted, with an intimation in the opening circular that a full list of prices, following the catalogue page by page, will be mailed on application.

Maynard's Socket Garden Trowels, described on page 453 and put on the market by Robert Murray, 24 Duane street, New York, are sold from the following list, which is subject to a discount of 20 per cent.:

5	6	7	8 inch.
\$4.50	\$4.50	\$5.00	\$5.50 per dozen.

Tucker & Dorsey Mfg. Company and Phoenix Caster Company, both of Indianapolis, Ind., have issued illustrated catalogues jointly under one cover. The line of Alarm Tills, Stove Trucks, Slaw Cutters and miscellaneous household specialties made by the Tucker and Dorsey Mfg. Company, and Martin's Patent Casters, made by the Phoenix Caster Company, are conveniently and effectively represented. The large and important line of Casters are represented in full-size cuts, and the more recent additions to the assortment shown. In regard to these two companies, it may be stated that the business of both is transacted from one office under the management of the same officers, although the companies are separate and distinct in other respects.

William Shimer, Son & Co., Freemansburg, Pa., issue an illustrated catalogue and price list showing the specialties in Hardware and House-Furnishing Goods of which they are manufacturers. Among these are represented the Keystone Sad-Irons, including those with detachable

wood handles and the regular goods, a large variety of Chest Handles, Bolts, Scales, Shelf Brackets, Hooks, Cast Nail Hammers, Stove Lifters, Match Safes, Garden Tools, &c. The Royal Washing Machine is also prominently represented.

The extent of the assortment carried by the house of Scott, Stevens & Co., Paducah, Ky., is referred to in a recent issue of the *Daily News*, of that city, their two three-story buildings being alluded to as stocked with a large variety of goods in the line of Hardware, Iron, Stoves, &c.

The *Humboldt Mechanic*, Eureka, Cal., illustrates the enterprise of E. Janssen & Co., to whose varied stock attention is prominently called, reference being made to many of the different lines of goods carried by them, in which Tools have a prominent place.

Office Salesmen.

A writer in a recent issue of *The Office*, discussing the treatment of customers who call on the home concern as contrasted with the treatment of those who are regularly visited by the traveling salesmen of the house, presents the following:

It has seemed to me, for some time past, that the matter of office salesmen in business houses is, in a great measure, a neglected subject. A merchant will use his utmost endeavors to secure the services of gilt-edged road men, and, having obtained his traveler, after much time, labor and skillful maneuvering, he will sit quietly in his chair expecting the man on the road to bring in the business. Such management puts the office in the position of a clearing-house, not of a live, active factor in the business transacted. Is this a proper way to conduct any business office? Frequently I have had occasion to enter large establishments where, on opening the door, a wilderness of goods greeted me, but no human face. Sometimes I have gone a distance of from 100 to 200 feet into a large city warehouse, and finally run against the office partition at the lower end, where a hard-worked bookkeeper, trying to find his balance, glared at me through the cashier's pigeon-hole, and in crusty tones asked, "What do you want?" That this is not an unusual case, nor an overdrawn picture, any man who has had occasion to enter large wholesale houses in New York and other cities can testify.

There are, however, some brilliant and shining exceptions to the rule. Of one case, a wholesale house in New York, I can speak from pleasant experience. At the head of the entrance stairs sits one of the partners of the concern. It is, of course, impossible for him to see every man who comes in, but every man who does come in is met at the top of the stairs by a clerk of pleasing address, who inquires his business. He is then referred to some salesman, who is instantly at his service. Should the visitor happen to be a large buyer in this particular line of goods, he is referred at once to the salesman partner already mentioned. This man was given an interest in the house, originally, on account of the immense amount of goods he could dispose of on the road. But does the ex-road salesman and present partner greet the visitor who has come in, perhaps, only to make a friendly call, with a curt, "What do you want?" Not so, at all. A hearty grasp of the hand, and "How are you?" uttered in whole-souled, magnetic tones, an inquiry as to the health of his family, and these various little incidentals that mean practically nothing, and yet are fraught with so much goodwill and interest to a man, and which seem to oil the wheels of business, are features of the greeting.

What is the result of this plan of action? Profitable business, of course. The house referred to, which, by the way, makes a

study of handling customers, whoever and wherever they may be, does the largest business in its line in the United States. It is a model for all other houses to copy after in each of its various departments. I offer these few remarks as a suggestion to the business houses that are in the habit of treating the incoming buyer almost as if he were a Pariah to be shunned, or, if attended to at all, who consider it enough that he is looked after by a junior clerk, whose ideas of business are at best nebulous. If a merchant wishes trade, and is paying much money to outside salesmen to bring it in, it seems but simple common sense to take care of it most carefully when it comes in of its own accord. Office salesmen should be provided and trained as well as road salesmen.

Exports.

PER SHIP SEA KING, MARCH 7, 1889, FOR SYDNEY, N. S. W.

By *Arkell & Douglas*.—324 dozen Handles, 140 dozen Axes, $\frac{1}{2}$ dozen Guns, 1200 feet Wire Cloth, 1 gross Wire Goods, 2 dozen Wringers, 1 dozen Lawn Sprinklers, 10 dozen Forks, 1 gross Egg Beaters, 9 dozen Wrenches, 1 dozen Wringers, 4 dozen Shears, 672 pounds Oil Stones, 1500 feet Hose, 1260 pounds Bolts, 30 cases Ranges, 12 dozen Door Springs, 8 cases Nails, 30 boxes Clothes Pins, 50 dozen Handles, 3 dozen Handles, 5 dozen Door Springs, $1\frac{1}{2}$ dozen Braces, 15 dozen Hatchets, $1\frac{1}{2}$ dozen Shellers, 32 Clocks, 2 gross Shade Rollers, 1 case Pumps, 2 cases Wrenches, 2 dozen Rakes, $\frac{1}{2}$ dozen Wringers, 12 dozen Lamp-ware, 1 case Saws, 76 dozen Brooms, 4 cases Hardware, 4 gross Blacking, 2 packages Plated-Ware, 2 cases Door Knobs, $\frac{1}{2}$ dozen Ladders, 1 dozen Levels, 50 dozen Washboards, 100 boxes Clothes Pins, 3 dozen Corn Mills, 2 boxes Saws, 1 box Wire Goods, 3 boxes Bells, 1 case Saw Sets, 600 feet Hose, 6 dozen Braces, 1 gross Blacking, 1 barrel Hose, 44 Guns, 57 sets Tools, 7 packages Hardware, 40,000 Primers, 30,000 Cartridges, 5 dozen Axes, 2 cases Varnish, 1 case Bolts.

By *McLean Bros. & Riggs*.—18 dozen Hoes, 68 dozen Handles, 7 dozen Braces, 54 dozen Axes, 10 dozen Plumbs and Levels, 18 sets Axes, 4400 Bolts, 7 dozen Braces, 18 Stoves, 30 Plows, 34 dozen Saws, 6 dozen Wrenches, 56 Guns, &c., 18 Vises, &c., 12 Scales, 24 dozen Padlocks, 12 dozen Hammers, 320 Handles.

By *A. S. Lascelles & Co.*—5 gross Axle Grease, 1 gross Handles, 3 dozen Saw Sets, 9 dozen Vises, 5 cases Cartridges, 55 dozen Axes, 6 dozen Picks, 10 dozen Axes, 100 boxes Clothes Pins, 33 dozen Saws, 20 dozen Axes, 1 case Broom Handles, 6 dozen Choppers, 10 gross Sewing Machine Oil, 1 case Tools, 5 dozen Braces, 2 cases Squares, 3 dozen Braces, $\frac{1}{2}$ gross Hammers, 72 pounds Tacks, $2\frac{1}{2}$ dozen Brackets, 1 case Tools, 25 dozen Washboards, 2 dozen Levels, 6 dozen Axes, 28 dozen Hatchets, 1 dozen Foot-Scrapers, 3 cases Brackets, 2 cases Broom Racks, 2 cases Perambulators.

By *R. W. Forbes & Son*.—1 case Hardware, 1 dozen Cow Bells, 1 dozen Wrenches, $\frac{1}{2}$ dozen Hay Knives, 2 dozen Braces, 18 sets Sad Irons, 3 sets Harness, 20 cases Sewing Machines, 17 dozen Fork Handles.

By *V. Basanta*.—171 dozen Locks and Keys, 10 Stoves, 26 dozen Lamp Goods, 4 dozen Egg-Beaters, 12 dozen Perambulators, 6 dozen Mouse Traps, 25 dozen Hatchets, 3 dozen Toy Wagons, 10 dozen Perambulators, 53 dozen Saws, &c., $11\frac{1}{2}$ dozen Barbers' Shears, 15 gross Blind Rollers, $1\frac{1}{2}$ dozen Stoves, 5 dozen Clocks, 100 gross Lamp Wicks, 1 dozen Lanterns, 26 dozen Lamp Goods.

By *Strong & Trowbridge*.—16 cases Hatchets, 1 case Hammers, 1 package Tools, 6 cases Hatchets, 6 cases Bolts, 1 case Hoes, 6 cases Hatchets, 3 cases Wrenches, 3 cases Hardware, 3 cases Hammers, 10 cases Hammers, 1 case Tools, 6 packages Castings, 1 case Nails, 1 case Pulleys, 1 case Tools, 1 case Lamp-ware, 6 cases Tools, 1 case Hardware, 1 case Brass Goods, 2 cases Tools.

By *Arnold, Cheney & Co.*—89 cases Handles, 1 crate Wheels, 3 crates Wheels, 5 Iron Castings, 14 cases Axes, 4 cases Saddlery, 6 cases Saddlery, 63,668 pieces Roofing Slate, 200 dozen Brooms.

By *Morris, Strouse & Co.*—79 dozen Axes.

By *W. E. Peck*.—3 cases Hardware, 2 dozen Churns, 9 dozen Hay Forks, 1 dozen Wheelbarrows, 1 case Call and Door Bells, $2\frac{1}{2}$ gross Mouse Traps.

By *F. B. Wheeler & Co.*—18 cases Skates, 4 cases Rubber Goods, 12 dozen sets Sad Irons, 5775 pounds Castings, 63 sets Harness, 25 dozen Axes, 36 sets Harness.

By *W. K. Freeman*.—102 pounds drills, 42 dozen Handled Axes, 6 cases Lamps, 6 packages Hardware.

By *Coombs, Crosby & Eddy*.—6 dozen House-Furnishing Goods, 4 dozen Lamp Goods, 20 dozen Mast Hooks, $12\frac{1}{2}$ dozen Tools, 11 cases Slates, 102 Stoves, 80 dozen Hatchets.

By *Welsh & Lea*.—21 cases Iron Bolts.

By *Healy & Earl*.—3 cases Saws.

By *H. W. Peabody & Co.*—86 packages Wind Mills, 14 cases Agricultural Implements, 6 cases Steel, 10 cases Carbons, 10,200 pounds Wire, 22,400 pounds Barb Wire.

By *R. W. Cameron & Co.*—3 boxes Machinery, 3000 pounds Machinery, 1370 pounds Rolling Machines, 6247 pounds Castings, 7 boxes Wheels.

By *McCoy & Sanders*.—1 bale Rubber.

By *Waterbury Clock Company*.—12 boxes Clocks.

By *Winchester Repeating Arms Company*.—188 pounds of Tools.

By *Edward Miller & Co.*—28 packages Lamp-ware.

By *S. Oppenheimer & Co.*—3 cases Machinery, 47 boxes Skewers.

By *Ilsley, Doubleday & Co.*—24,100 pounds Bolts, $12\frac{1}{2}$ gross Axle Grease, $12\frac{1}{2}$ gross Axle Grease, 24 dozen Stencils, 1 box Paint, &c.

By *A. Field & Co.*—33 dozen Axes.

By *Manhattan Brass Company*.—20 cases Lampware.

By *B. F. Avery & Sons*.—2 boxes Plow Irons, 9 packages Plows.

By *Collins & Co.*—130 dozen Tools.

By *Edward Miller & Co.*—33 packages Lamp Goods, 24 packages Lamp Goods.

By *Ansonia Clock Company*.—32 boxes Clocks.

By *Nerius & Harland*.—23 boxes Shade Rollers, 1 box Shade Rollers.

By *H. L. Judd & Co.*—8 packages Brass Goods.

By *Simpson, Hall, Miller & Co.*—7 cases Silver-Plated Ware.

By *L. H. Mace & Co.*—17 Refrigerators.

By *W. H. Crossman & Bro.*—12 Gross Fish Lines, 7 packages Carriage-Ware, 1 case Stone, 1 case Hardware, 1 case Plow Parts, 6 pairs Bolt Clippers, 2 dozen Stoves, 7 crates Hardware, 8 cases Tools, 36 cases Hardware, 2 Tire Banders, 10 dozen Glue, 34 dozen Grindstone Fixtures, 3 gross Traps, 8 cases Hardware, 500 pounds Nails, 80 dozen Handles, 9 Miter Boxes, 30 dozen Handles, 8721 pounds Iron Bolts, 3 boxes Hardware, 1500 pounds Staples, 24 dozen Lamp Goods, 6 packages Pump Parts, 3 dozen Dashers, 100 dozen Traps, 1 dozen Guns, 50,000 Primers, 1 dozen Corn Shellers, $\frac{1}{2}$ dozen Mills, 1 dozen Store Trucks, 14 dozen Hatchets, $6\frac{1}{2}$ dozen Meat Choppers, 4 cases Hardware, 336 pounds Stone, 218 pounds Glue, 40 dozen Handles, 3 gross Lemon Squeezers, 40 dozen Hatchets, 1 case Hardware, 9 dozen Grindstones and Parts, 17 dozen Cages, 2 dozen Tools, 1 case Lamp Goods, 3700 pounds Iron Bolts, $3\frac{1}{2}$ dozen Meat Choppers, $2\frac{1}{2}$ dozen Corn Mills, 2 dozen Wagon Jacks, 1 dozen Stencils, 2 dozen Squares, 20 dozen Hatchets, 7 cases Hardware, 1 case Handles, 60 sets Rifle Tools, 10,000 Primers, 1 dozen Wringers, 20 dozen Axes, 40 dozen Handles, 12 dozen Lifters, 6 gross Sewing Machine Oil, 1 case Pumps, 1 dozen Hardware, 1 dozen Egg Beaters, 2 dozen Pails, 25 boxes Clothes Pins, 1 case Hardware, $2\frac{1}{2}$ dozen Step Ladders, 6 dozen Handles, 7 dozen Hatchets, 6 dozen Lawn Sprinklers, 15 dozen Traps, $6\frac{1}{2}$ dozen Clocks, 6 dozen Miter Boxes, 60 dozen Axes, 7 dozen Freezers, 2 cases Wire, 55 cases Hardware, 57 dozen Axes, 50 dozen Polish, 1 case Stencils, 42 dozen Washboards, 420 dozen Handles, 8 gross Sewing Machine Oil, 1 case Plow Parts, 16 cases Agricultural Implements, 1 case Hardware, 5 gross Mucilage, 1 case Pistols, 1372 pounds Iron Bolts, 10 packages Hardware, 3 dozen Scales, 450 pounds Nails, 3 cases Lamp Goods, 1 case Stoves, 1 case Hardware, 1 dozen Bush Hooks.

PER BARK ALICE, MARCH 11, 1889, FOR DUNEDIN, NEW ZEALAND.

By *Arkell & Douglas*.—1 case Hardware, 1 case Whips, 1 case Tacks, 1 case Snaps, 1 case Castings, 100 dozen Handles, 3 cases Axes, 1 case Saws, 210 pounds Bolts, 1 case Bolts and Nuts, 2 dozen Churns, 2 cases Hardware, 5 cases Axes, 1 dozen Braces, 1-6 dozen Scales, 1 box Hardware, 2 cases Pumps, 2 cases Rivets.

By *H. W. Peabody & Co.*—8 cases Agricultural Implements, 45 packages Hardware, 17 cases Lamp Ware, 3 cases Bolts, 25,400 pounds Barb Wire, 200 pounds Nails, 1 case Pumps, 25 dozen Brooms, 25 dozen Stone, 18 bundles Carriage-Ware, 15 packages Lawn Mowers, 19 Stoves, 4 dozen Stencil Combinations, 7 packages Hardware, 11,248 pounds Barb Wire, 2 cases Clocks, 7 cases Axes, 1100 pounds Horse Nails, 4 packages Lampware, 12 stoves, 1 case Agricultural Implements, 2 packages Plated-Ware, 1 case Clocks, $1\frac{1}{2}$ dozen Polish, 7 cases Agate-Ware, 8 cases Lawn Mowers, 4 packages Agricultural Implements, 1 crate Freezers, 1 case Stoves, 44,800 pounds Wire.

By *R. W. Forbes & Son*.—2 packages Grinders.

By *Strong & Trowbridge*.—3 cases Spade Handles, 6 cases School Slates, 1 case Glue, 1 case Hardware, 1 case Wire Goods, 2 cases Sluice Forks, 1 case Rakes, 10 cases Nails, 3 cases Axes, 1 bale Leather Belting, 1 case Lampware, 1 case Carpet Sweepers, 2 cases Hardware, 1 case Rivets, 1 case Wire Goods, 1 case Spade Handles, 2 cases Lampware, 1 case Rakes, 1 case Plated-Ware, 1 case Manure Forks, 1 case Tin Rivets, 1 case Lampware, 1 case Hatchets, 1 case Tinware, 3 cases Axe Handles, 2 cases Hatchets, 1 crate Churns.

By *A. Field & Co.*—7 Choppers, 6 dozen Traps.

By *W. K. Freeman*.—15 packages Lamp Goods.

By *Ansonia Clock Co.*—15 boxes Clocks.

By *Chas. Brewer & Co.*—11,200 pounds Wire, 1 case Agricultural Implements, 4 cases Creamery Goods, 1 case Tools, 7 cases Tools, 3 cases Agricultural Implements, 8 cases Nails, 6 cases Hardware, 6 cases Hardware, 4 cases Agricultural Implements, 4 cases Stamped-Ware, 14 cases Hardware, 2 cases Grease, 3 cases Agricultural Machinery, 5 cases Nails, 1 case Pumps, 6 crates Stoves, 1 case Oil Stones.

FOR AUKLAND.

By *Arkell & Douglas*.—18 dozen Handles, 3 dozen Hammers, 6 dozen Hardware, 1 bale Cordage, 1 case Saws, 4 cases Hardware, 3 cases Axes, 4 packages Lampware, 4 Ranges, 1 box Hardware, 500 Broom Handles, 4 cases Varnish, 1 bale Twine, 36 dozen Handles, 5 dozen Handles, 500 Broom Handles, 23 cases Axes.

By *H. W. Peabody & Co.*—4 cases Agricultural Implements, 6 cases Hardware, 1 case Agricultural Implements, 1 case Carriage-Ware, 7 cases Hardware.

By *R. W. Forbes & Son*.—10 cases Scales, 4 crates Store Trucks, 1 case Wire Mats, 6 boxes Scales, 1014 pounds Carriage Bolts, 1 case Pistols, 1480 pounds Horse Nails, 6 dozen Lemon Squeezers, 200 boxes Clothes Pins, 5 packages Hardware, 181 pounds Horse Nails, 42 packages Hardware, 24 packages Lawn Mowers, 3 cases Shade Rollers, 111 dozen Axes, 6 cases Axle Grease, 10 cases Lawn Mowers, 70 dozen Shovel Handles, 19 packages Churns, 1324 pounds Carriage Bolts, 70 dozen Spade Handles, 8 dozen Axes, 2 packages Shellers, 9 packages Harrows, 34 dozen Handles, 51 packages Axes, 2 packages Hardware.

By *Arnold, Cheney & Co.*—7 dozen Sieves.

FOR AUCKLAND AND DUNEDIN.

By *R. W. Cameron & Co.*—3 packages Dairy Goods, 3 cases Fan Mills, 10 cases Dairy Goods, 5 packages Dairy Goods, 1 box Scales, 1 Boiler and Engine, 1 box Wheels, 1 box Speed Indicators, 21,000 Slates, $6\frac{1}{2}$ gross Grease, 125 dozen Brooms, 300 cases Clothes Pins, 30 dozen Handles, $3\frac{1}{2}$ dozen Grease, 200 cases Clothes Pins, 660 pounds Grease, 55,999 pounds Barb Wire.

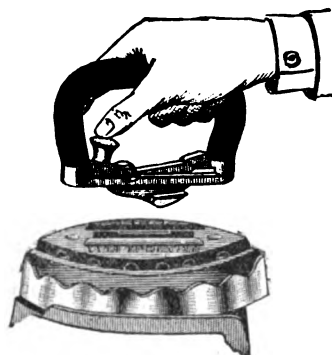
A. J. List, formerly with J. P. Withrow, of Pittsburgh, and N. J. Mitchell, recently with M. V. Smith, also of Pittsburgh, have formed a copartnership under the name of List & Mitchell, for the purpose of carrying on the engineering and contracting business in all its branches. The new firm are prepared to furnish plans and specifications for the erection of gas producers, steel plants, rolling mills, &c. They are also general agents for the S. C. Collin low-blast converter, especially adapted for small steel foundries. The temporary headquarters of the firm are in the Bissell Block, Pittsburgh. After April 1 they will be found in the Lewis Block, in that city.

The visit of two representatives of the Chicago rail manufacturers to Pittsburgh, and their conferring with H. C. Frico, of the Edgar Thomson Works, led local proprietors to suspect that the Pittsburgh mill was to be gathered into the Chicago steel rail consolidation. We have good ground for stating that Mr. Frico was merely called upon to appraise some coke property in the Connellsville region belonging to one of the three Chicago mills which were consolidated.

The reports that the works with which Cooper, Hewitt & Co. are identified are to be moved to the South are premature, to say the least.

A New Detachable-Handle Sad-Iron.

The sad-iron represented herewith is put on the market by the Colebrookdale Iron Company, Pottstown, Pa. The cut shows it mounted on a stand with the handle detached. The manufacturers direct special attention to the fact that the handle is made of the best selected applewood, which is referred to as exceptionally strong and durable, every handle being worked out by machinery. They also make the point that the shape of the handle is such as to permit the hand to grasp it naturally without cramping the fingers. As indicated in the illustration, the release of the handle is accomplished by pressing downward on the button shown, the handle being then readily disengaged by a backward motion. The



New Detachable-Handle Sad-Iron.

manufacturers emphasize the importance of this feature, pointing out that in other irons the handles are released by drawing upward a button, which is very near the iron, thereby exposing the fingers to burning. The irons are highly polished and put up in sets of three, with handle and stand, in labeled cardboard boxes made specially heavy and strong. This will be recognized as an interesting and important addition to their well-known line of sad-irons.

Socket Garden Trowel.

The illustration given below represents Maynard's socket garden trowel, which is put on the market by Robert Murray, sole agent, 24 Duane street, New York. It is described as made of solid cast steel in 5, 6, 7 and 8 inch sizes. It is not intended to compete with the many low-priced



Socket Garden Trowel.

trowels which are on the market, but is offered to those who desire a durable article of exceptional quality.

The Seaside Lemon Press and Strainer.

This article is put on the market by James D. Frary, Meriden, Conn., for whom it is manufactured by the Meriden Malleable Iron Company. Fig. 1 represents it applied to table and in use, and Fig. 2 shows the strainer and plate, on the top of which the lemon is to be operated upon is placed. The special features of the press and strainer and the manner of its use are thus clearly indicated, the pressure on the lemon being exerted by means of the handle or lever with a rack

and pinion movement, thus giving all requisite force, and producing, according to the claim of the manufacturer, one-third more juice than other squeezers on the market. By means of the plate and strainer, Fig. 2, the pulp and seed are

the strainer and the plunger are accordingly lined with pure britannia metal, which is referred to as free from lead or poisonous ingredients and proof against lemon juice. It is stated that by constant use without cleaning the metal will grow dark, and it is recommended that it should be cleaned as often as once a week by using common white sand or sapolio, thus keeping it clean and white. The metal is referred to as of suitable thickness, so that it can be scoured daily for years and not wear through. It will thus be seen that the well-founded objection to the use of galvanized-iron lemon squeezers is satisfactorily met. The different parts of this

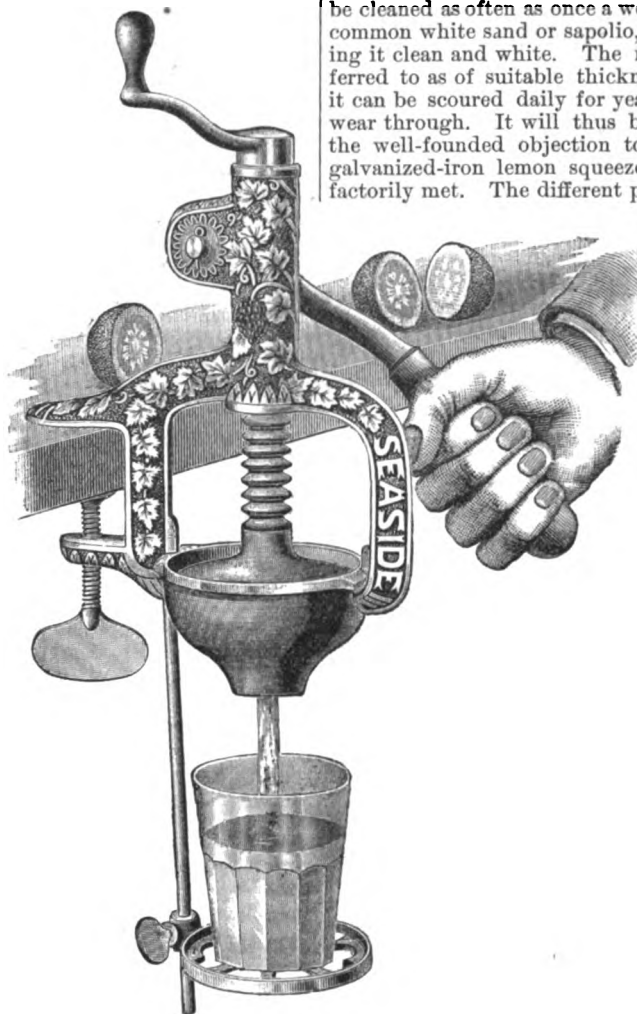


Fig. 1.—The Seaside Lemon Press and Strainer.

prevented from escaping with the juice. The arrangement by which the receptacle for the juice is held in position will be observed, and it is to be noticed that it is adjustable to any desired height. The cup in which the lemon is placed is easily removable so as to permit its convenient cleaning, and the strainer also, which is

article are furnished separately if desired, so that in case of damage it can easily be replaced. Besides the utility of this article and its efficiency and convenience for the purpose for which it is made, the elegant finish and attractiveness are also alluded to.

Buffalo vies with other lake cities in the effort to attract the ore trade, and improved docks are to be erected during the coming season. Recently the Lackawanna contracted with the Excelsior Iron Works Company, of Cleveland, for a complete plant of Thornberg patent derricks, six in number. They will be put in at the foot of Erie street, and will be used for the transferring iron ore from vessels to cars.

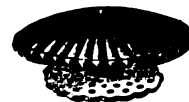


Fig. 2.—Plate and Strainer.

placed in it, can be taken out at pleasure, thus greatly facilitating the keeping clean of these parts of the press. A point on which especial emphasis is laid is the character of the interior finish of the removable cup and also of the plunger which presses upon the lemon, as the lemon juice is a strong acid and liable in a short time to eat into metals with which it comes in contact. Mr. Frary explains that in the effort to produce a substance proof against lemon juice he tried porcelain, enameling, tinning on iron, coating with rubber and nickel-plating, all of which were unsatisfactory; but at last it was discovered that block tin or britannia metal, was best suited for this purpose. In the machine illustrated above the cup-plate,

The work will be finished by May 1. A dispatch says: "With Ohio ironmen coming here to establish blast furnaces, and the extensive preparations making to handle large quantities of ore, it looks as if Buffalo would soon take the place in the iron trade that many observers believe to be hers by right of position as a natural receiving and shipping point."

Chandler & Washburn's Quick-Action Vises.

A vise embodying new features, intended for the use of pattern-makers and wood-workers in general, is represented in the accompanying illustration, and manufactured by Chandler & Washburn, 30 Kilby street, Boston, Mass. In this vise the nut is whole, drilled and tapped to fit a long screw. When the handle is in an

Twenty-five broke on striking a moderate blow. Yet all had been accepted and paid for previous to the agitation caused by the Parliamentary Investigating Committee.

Hay Knife.

G. & M. Nolin, Skowhegan, Me., are putting on the market the hay knife represented in the accompanying illustration,

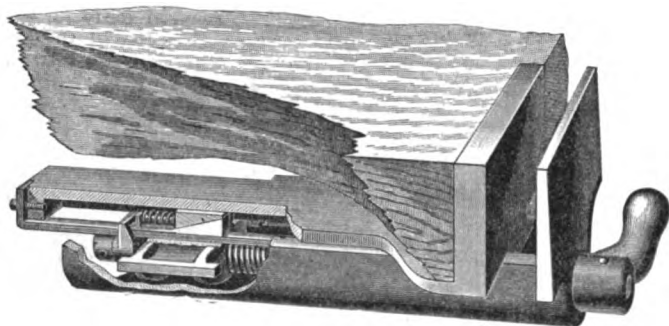


Fig. 1.—Chandler & Washburn's Quick-Action Vise.

upright position and carried as far to the left as possible, this nut is released from the back jaw, or, more strictly, released from the long flat rod fastened to the back jaw. The front jaw is then free to slide, and the nut and screw move with it. When it has been brought up to the work by turning the handle to the right about a quarter turn the nut is clamped to the rod, and if the handle is still turned to the right the nut remains stationary, and the screw works through it until the desired amount of compression is obtained. With this construction it will be seen that in any position the jaws can be brought together by means of the screw if desired. In ordinary work, however, the front jaw is slid against the wood and the handle turned a part of a turn to the right, thus giving a secure grip, and when a new piece is to be inserted the handle is turned back to its first position, when the jaws may be adjusted to the new work, and by means of the handle the requisite pressure be again applied. If extra compression should be required it is simply necessary to continue the operation of clamping until the desired result is obtained. The manufacturers call attention to the advantages possessed by these vises in the convenience

and call attention to the improvements in its manufacture. The blade or cutting part is described as made from fine sheet steel worked in water and hardened in oil. There is a slight groove along the back for the purpose of giving stiffness or rigidity to the thin blade. The serrated form of tooth, it will be observed, is retained.

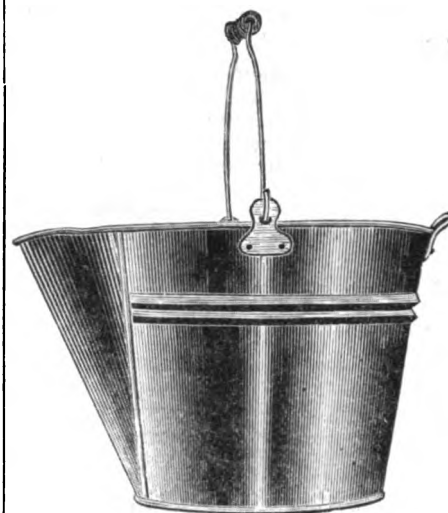


G. & M. Nolin's Hay Knife.

The blade is securely fastened to a strong iron shank, upon which are driven ferruled hardwood handles strongly riveted. The knife thus formed is 35 inches long by 3 inches wide at the widest part, weighing only 2½ pounds. That it is readily sharpened and from its extreme thinness readily forced through closely packed material are points in regard to it which are emphasized by the manufacturers, and its conse-

The Alderney Milk-Strainer Pail.

By means of the engravings presented herewith we lay before our readers a general view of the Alderney Milk-Strainer



The Alderney Milk-Strainer Pail.—Fig. 1.—General View.

Pail, which has recently been placed upon the market by Wm. J. H. Gluck, of Baltimore, Md. This device is a combination water pail, milking bucket, milk cooler,

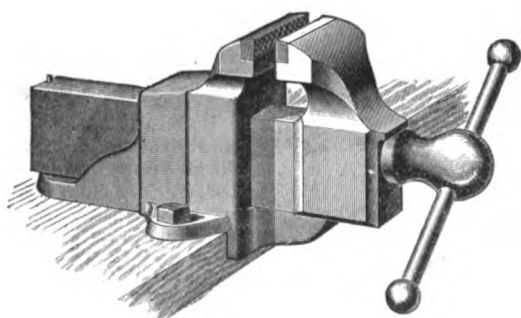


Fig. 2.—Quick-Action Machinists' Vise.

and rapidity of their action, their finish, strength, simplicity of construction and durability. They are made in two sizes, with a width of jaw 10 and 14 inches, weighing respectively 53 and 60 pounds. Their machinists' vise represented in Fig. 2 is made on the same principle, and has the same general construction as the wood-workers', the shape of the parts being changed to correspond with the different uses for which it is intended.

Out of the 419 swords in use in the Fifth Dragoon Guards of the British army only 363 passed the test recently made.

quent adaptation for cutting hay, straw, corn stalks, ensilage, peat, &c. They also allude to their improved methods and machinery as enabling them to put it on the market at a moderate price.

A school-ship for the training of seamen will be stationed at Philadelphia, at a cost of \$25,000 per annum, of which the State will contribute \$10,000 and the city \$15,000. The Saratoga has been detailed from the navy for this purpose. Capt. Lawrence, harbor master of the port, says the training ship should be on water what our manual training school is on land.

cloth or wire strainer bucket, as the user may prefer. It is of such shape as to give a natural flow of the contents with no drip remaining. It has no spout to break off or become leaky; is easily and thoroughly cleaned, and may be employed with a wire or cloth strainer, as the case may demand. The adjustment of the strainer is very simple and requires but a moment's time to accomplish. In Fig. 1 of the cuts is shown a general view of the pail, while the small engravings shown in Fig. 2 represent the strainers which may be employed with the pail. A bar runs along under the strainer and prevents anything from passing out between the sides of the strainer and the pail. This article, it is

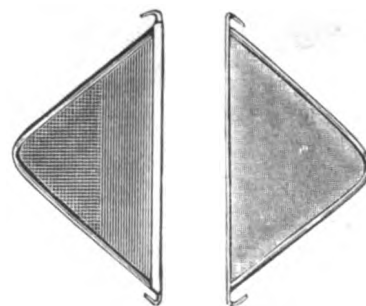


Fig. 2.—General View of Strainers.

claimed, may be packed very closely for shipment, eight Alderney pails requiring the same space as two of the old-style strainer pails. It is made of 10 or 12 tin, as may be desired.

Building is active in Philadelphia. Of 1363 permits issued this season, more than half are for two-story dwellings.

New Jail Padlocks.

The illustrations herewith given represent a new lock which is put on the market by the Allendale Lock Company, Lancaster, Pa. Fig. 1 represents the lock cut

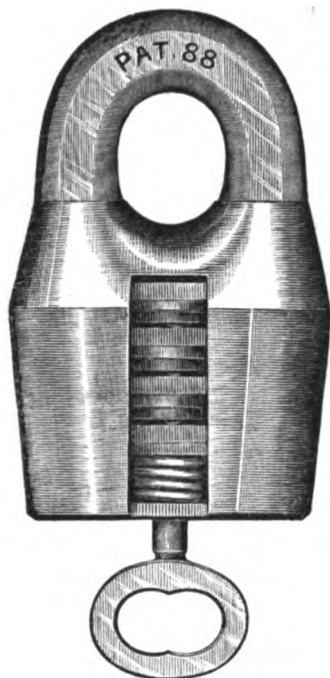


Fig. 1.—Jail Lock No. 512, Cut Open to Show Interior.—Full Size.

open so as to show the interior construction, Fig. 2 the form of the nickel-plated key, and Fig. 3 their patent tumbler and stationary plate. All these cuts are full size. This lock is designated as their No. 512, and is put on the market to meet the



Fig. 2.—Key.

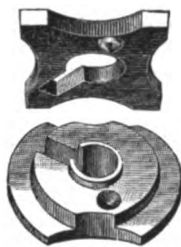


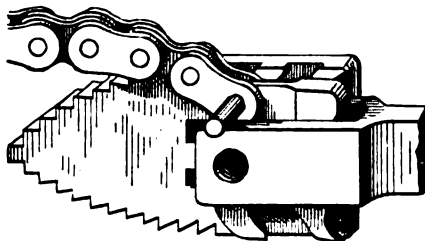
Fig. 3.—Patent Tumbler and Stationary Plate.

demand for a jail lock of superior quality and security. It is made of brass and weighs $7\frac{1}{4}$ pounds to the dozen. The company call special attention to the mechanism and construction as being different from that of any other padlocks. As shown in Fig. 3, the tumblers are interlocking top and bottom, and the flanges of each tumbler meet through the stationary plates, making it impossible to pick them. While by using a lockpick one tumbler can be turned open, the point is made that the pick cannot be raised to the next tumbler and cannot be taken from the lock without first turning the tumbler into position. It will be noticed that the tumblers are so arranged that when the movable tumbler is locked in position to remove the key the projection on the

stationary plate, Fig. 3, engages in the opening or cavity in the movable plate also shown in Fig. 3, and the downward pressure of the spring presses the tumblers together, so that it is impossible for them to move out of place, as is often the case with other locks. These goods are put on the market with a full guarantee that they will not get out of order. They are packed separately in cartons, half dozen in a box. The company also manufacture a line of cheaper goods, to the quality and low price of which they allude.

The Improved Brock Patent Chain Pipe Wrenches.

The accompanying illustration represents an improvement recently made in the Brock chain pipe wrenches manufactured by J. H. Williams & Co., 9 to 15 Richards street, Brooklyn, N. Y. The cut represents the wrench with one side of the head



The Improved Brock Patent Chain Pipe Wrench.

removed, so as to give some of the details of construction, which could not otherwise be so satisfactorily shown. As the wrench is now made it will be seen that, besides the steel pin by which one end of the chain is fastened, there is a steel safety link, which engages firmly with the jaws, thus giving an element of strength not found in other wrenches, and constituting, it is considered by the manufacturers, a valuable improvement in this wrench. The addition of the safety link does not affect the reversibility of the tool, and it is to be noticed that the other end of the chain engages with the jaws in a similar manner, as shown in the cut, thus giving the increased security at either end.

The Mikado Watering Pot.

William J. H. Gluck, of Baltimore, Md., has just brought out a new style of watering-pot, known as the Mikado, a general



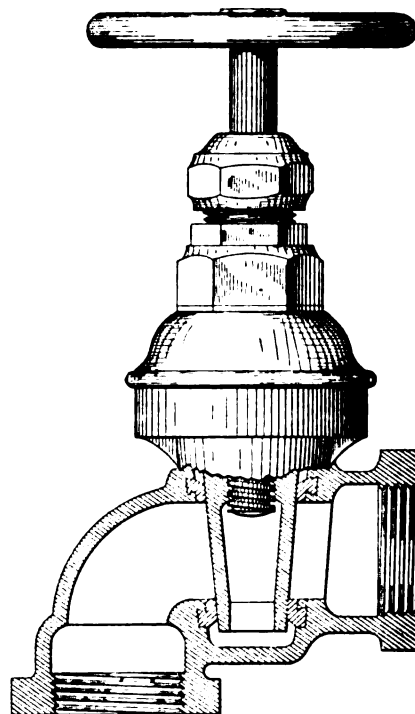
The Mikado Watering-Pot.

view of which is afforded by means of the accompanying illustration. It is constructed in such a way that the contents will not slop over, and is of a shape which the manufacturer states gives a natural flow to the water. It is provided with a zinc rose having a detachable perforated

piece. The bottom is protected by a foot, rendering it more durable than would otherwise be the case. The pot has no stays to break off, and when drained it is said no liquid accumulates in the spout, as with the old style of watering-pots. The Mikado is made in 10 sizes, japanned in assorted colors and handsomely decorated when desired. It is well made throughout and is claimed to be one of the most practical watering-pots for the conservatory or garden ever put on the market.

Angle Gate Valve for Radiators.

Various contrivances have been proposed to catch the leakage from stuffing boxes of radiator valves, so as to prevent



Angle Gate Valve for Radiators.

damage until the valve can be repacked. In steam-heating apparatus the angle or corner valve may be closed and all leakage is prevented, but hot-water circulating jobs, where generally only one valve is used, the closing of the angle or corner valve does not stop the leakage through the stuffing box, as the water is still in contact with the upper or stuffing box end of the valve through the radiator. The accompanying cut shows a new application of a solid gate valve, and among other advantages of greater importance claimed for it, it prevents leakage at the stuffing box when closed on a hot-water heating job, as the double seat on the gate cuts off all pressure from the stuffing box, which can be easily packed. The space occupied by this form of radiator valve is the same as that of a well-designed angle valve. On an inch valve the height from lowest point to top is about $7\frac{1}{4}$ inches, and the length over all about 4 inches. Another point in this valve of particular worth is the curved elbow by which direction is given to the flow of steam or water, thus materially reducing the friction and abolishing what might be termed the rebound, which occurs in angle or corner valves. The foregoing are some of the general claims made for this valve, and an examination of the sketch will further explain its design and construction. These valves, which are made with moving or stationary spindles as desired, are manufactured by the Chapman Valve Manufacturing Company, Indian Orchard, Mass., and 72 Kilby street, Boston, Mass.

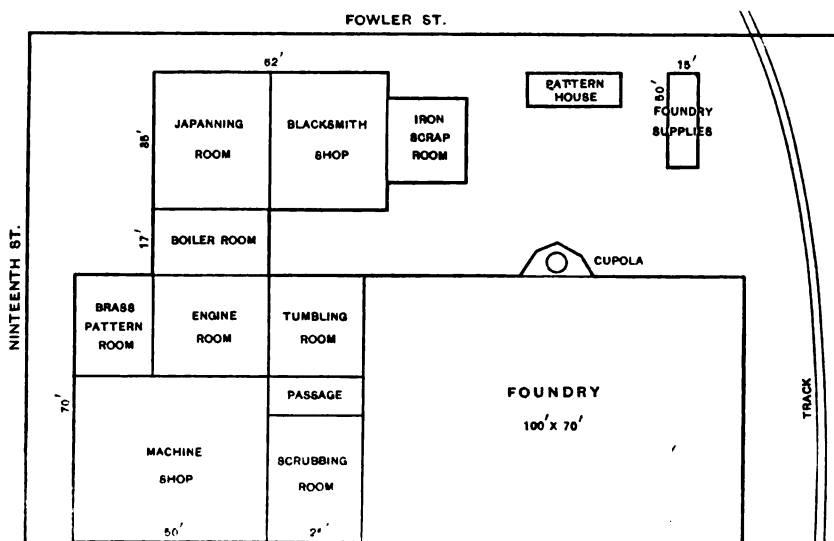
The Moore Manufacturing and Foundry Company.

The new works of the Moore Manufacturing and Foundry Company, at Milwaukee, Wis., are now in full operation. A sketch of their ground plan is shown herewith. The erection of the works was begun on August 10 last, and on November 20 the first foundry heat was taken. Much of the time since then has been employed in the construction of tools for the works, most of the machinery used being built from the company's own designs, and especially adapted to their use. From 70 to 100 hands are employed. The works have already proved too small to accommodate the increasing business of the company, and they have in contemplation the erection of an addition to the foundry in the spring, which will be of about the same size and tonnage capacity as the present one. Having an acre and a half of ground, they have ample room for the extension of their facilities.

The main building of the works is 50 feet deep and 70 feet front, with three floors. The ground floor is occupied by

All the buildings except the boiler-house are frame. The foundry is well lighted on three sides and well ventilated through revolving panels in the skylight. It is equipped with a traveling crane 25 feet long, extending over one side of the building, with a track running the whole length, and designed to handle heavy castings and flasks. The cupola occupies a small annex at the side of the foundry which is lined with corrugated iron. The whole plant is lighted by electricity furnished by a Brush dynamo operating 90 lights of 16 candle-power each.

The office is finished in Virginia pine. The stairway to the third floor is immediately outside of the office, and the space under it is utilized for a cloak-room, wash-room, &c. Under the lowest part of the stairway ten drawers or slides, 30 by 30 inches each, have been fitted in, for the storage of electrotypes. The whole building is heated by steam except the foundry, which is kept comfortable by the heat from two large core ovens. Adjoining the foundry is a brick pattern-room in which all patterns are stored, saving insurance and securing protection from fire.



Works of Moore Mfg. and Foundry Co., Milwaukee, Wis.

the machine shop, finishing department and engine-room. The second floor is used for the office, stock-room, pattern shop and draftsmen's room. The latter has complete arrangements for making blue prints, including a dark-room. In making exposures the plates are run out of the dark-room on rollers through the side of the building on a frame over the roof of the foundry which is in the rear, and thus take very little handling. The third floor is used for a store-room and for finishing. An elevator of two to three tons capacity is used in handling materials from one floor to another. The foundry is one story high, 70 feet wide by 100 feet deep, and contains 28 molding floors and a cupola with a capacity of 10 tons a day. Between the foundry and the main building are the tumbling-room and the scratching-room, each 25 feet by 35 feet, the tumbling-room having exhaust fans. The engine is of 50 horse-power, automatic cut-off, and was built by the Filer & Stowell Mfg. Company. The boiler-room adjoins the engine-room and is 17 feet by 35 feet. Beyond the boiler-room is the japanning-room, which, in connection with the blacksmith shop in the rear, occupies a building 35 feet by 62 feet. The japanning room contains two large baking ovens, built of solid brick, with brick arches, and a large annealing oven. The baking ovens are fired from the boiler-room. Attached to the blacksmith shop is an iron stock-room.

The works are located on the Milwaukee and St. Paul, Wisconsin Central and Milwaukee and Northern railroads, having a switch 300 feet in length for their exclusive use. Along the track near the foundry is a building, 15 by 50 feet, two stories high, for storing inflammable material and coke, sand and general foundry supplies. An ample supply of water is secured from a well on the premises 80 feet deep. It is stored in a tank from which the boilers are supplied. The pumping is governed by an automatic float which regulates the supply and keeps the water in the tank at a certain depth.

The company are now engaged in making their own hardware specialties, such as door hangers, pulley blocks, vises, &c., and will shortly engage in some new lines which they are not as yet prepared to mention. They are also making job castings for a great variety of machinery as well as for hot-air furnaces, and are in a position to take contracts for building machinery.

The Interstate Commerce hearing at Washington, at which the trunk lines were represented, was suspended on Monday for two weeks, to allow Southern roads an equal opportunity. In concluding the hearing, Judge Cooley said: "Here is the law, and it is not for you hereafter to say to us that there are practical obstacles in the way of complying with it; that you would lose business by

so doing, and all that sort of thing. We are not concerned in that. We do not wish to do anything to make you lose business; at the same time we cannot accept it as a valid excuse that if you obey the law you will thereby lose business. The time ought to be considered as gone by when a manager can come to us and say: 'I named this rate, and I did it regardless of law, because my competitor has done the same thing.' * * * I trust that, after saying so much, we shall not two weeks hence have complaints brought to us that these practices have been going on in the meantime. Parties must not take the redress of wrongs into their own hands when the legality of what they complain of is, to say the least, very doubtful. They ought to remember, too, that, though the hearing is suspended two weeks, the law is not suspended; that remains in force, and the penalties are in the meantime pronounced against all violators, just as much as though no such continuance had been taken."

A New Natural Gas Company.

A new corporation, known as the Equitable Gas Company, has just been organized at Pittsburgh for the purpose of dealing in natural gas. The new organization has a capital stock of \$1,000,000, and has secured 2000 acres of gas territory with a high pressure, lying 5 miles north of Murrysville. The line from the field to Pittsburgh is to be cast iron, and the contracts for making the pipe have been placed with the Addystone Pipe Company, of Cincinnati, and Dennis, Long & Co., of Louisville. These contracts are now being filled, and the first of the pipe will be received within a short time. Starting at the wells, the line will be 24 inches in diameter for 6 miles. From that point to the city the size will be increased to 30 inches. The mains in the city will be 30, 24, 18 and 12 inches, according to the service demanded. All will be of cast iron. The company is composed of manufacturers who organized it for their own benefit. The primary object will be to furnish gas to the mills and factories of the firms interested, while any surplus will be sold to other mills. The idea in putting down so large a main is to prepare for any contingency that might arise in future years by reason of the pressure at the wells becoming reduced. The following are the officers of the company: Directors, Reuben Miller, J. Stuart Brown, James Hemphill, Robert B. Brown, Charles H. Zug, A. F. Keating, George Trautman, L. M. Morris and Frank B. Robinson; president, Robert B. Brown; treasurer, Reuben Miller; secretary, William H. Alldred; engineer, William D. Hartupce.

Witherbees, Sherman & Co., of Port Henry, have announced their opening prices for "Old Bed 21 Ore," offering to sell 150,000 tons of selected lump for puddling at \$4 per gross ton, and 225,000 tons of furnace ore at \$2.50. If the purchaser elects to pay cash for any month's delivery on or before the 15th of the following month an abatement of 50 cents per ton will be allowed on selected lump and 25 cents per ton on furnace ore. These abatements for cash payment are increased to 65 cents and 35 cents respectively prior to August 1.

The Beckett & McDowell Mfg. Company, of Arlington, N. J., are putting up a plant of crushers, rolls, &c., for an electric separating mill for the Theall Mine, at Croton, N. Y., owned by the Cheevers. We understand that the capacity of the plant is to be 100 tons of concentrates daily.

CURRENT HARDWARE PRICES.

MARCH 20, 1889.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers' name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers, at the figures named.

Ammunition.—

Caps, Perfection, 1000—	
Hicks & Goldmark's	50¢
F. L. Waterproof, 1-10's	50¢
E. B. Trimmed Edge, 1-10's	50¢
E. B. Grad. Edge, Cent. Fire	25¢
1-10's 70¢	75¢
Double Waterproof, 1-10's	50¢
Musket Waterproof, 1-10's	50¢
G. D.	25¢
S. B.	30¢

Union Metallic Cartridge Co.	
F. C. Trimmed	50¢
F. L. Ground	25¢
Cent. Fire Ground	25¢
Dbl. Waterproof	75¢
Dbl. Waterproof, in 1-10's	1.40
S. B. Genuine Imp.orted	45¢
Kley's E. B.	54¢
Kley's D Waterproof, Central Fire	1.60

Cartridges.	
Rim Fire Cartridges	50¢
Rim Fire Military	50¢
Cent. Fire, Pistol and Rifle	25¢
Cent. Fire, Military and Sporting	15¢
Blank Cartridges, except 22 and 32 cal., additional 10% on above discounts.	
Blank Cartridges, 22 cal., 1.75	2¢
Blank Cartridges, 32 cal., 3.50	2¢
Primed Shells and Bullets	15¢
B. B. Caps, Round Ball, 1.75	3¢
B. B. Caps, Round Ball, 2.00	3¢
Primers	
Berdan Primers, 1.00	3¢
B. L. Caps (for Sturtevant Shells) 1.00	3¢
All other Primers, 1.20	3¢

Shells—	
First quality, 4, 8, 10 and 12 gauge	25¢
First quality, 14, 16 and 20 gauge (\$10 list)	30¢
Star, Club, Rival and Climax brands, 10 and 12 gauge	33¢
Club, Rival and Climax brands, 14, 16 and 20 gauge	30¢
Seibold's Comb. Shot Shells	15¢
Brass Shot Shells, 1st quality	60¢
Brass Shot Shells, Club, Rival, Climax	60¢
I X L, 10 and 12 gauge	40¢
"Special," 16 gauge	30¢
"Special," 10 and 12 gauge	40¢
Fowler's Pat.	3.25

Shells Loaded—	
A. M. Co. List No. 19, 1887	20¢
Wads—	
U. M. C. & W. R. A.—B. E., 11 up	2.00
U. M. C. & W. R. A.—B. E., 9&10	2.30
U. M. C. & W. R. A.—B. E., 7&8	2.60
U. M. C. & W. R. A.—P. E., 11 up	3.10
U. M. C. & W. R. A.—P. E., 9&10	4.00
U. M. C. & W. R. A.—P. E., 7&8	4.90
Eley's B. E., 11 up	1.75
Eley's P. E., 11 up	2.80

Anvils—	
Eagle Anvil, 7 lb 104	20¢
Peter Wright's	9¢
Armstrong's Mouse Hole	84¢
Armstrong's Mouse Hole, Extra 11	111¢
Trenton	9¢
Wilkinson's	9¢
J. & Riley Carr, Pat. Solid	11¢
Moore & Barnes Mfg. Co.	33¢

Anvil Vise and Drill—	
Cheney Falls Co., 18.00	20¢
Cheney Anvil and Vise	25¢
Allen Anvil and Vise	40¢

Apple Parers—	
Advance	7¢
Antirion Combination	5¢
Baldwin	5¢
Champion	7¢
Eureka, 1888	12¢
Family Bay State	17¢
Gem	5¢
Gold Medal	4¢
Hudson's New '88	3¢
Ideal	3¢
Improved Bay State	5¢
Little Star	5¢
Monarch	13¢
New Lightning	5¢
Oriole	4¢
Penn.	4¢
Perfection	4¢
Pomona	4¢
Rocking Table	6¢
Turntable	4¢
Victor	13¢
Waverly	4¢
White Mountain	4¢
75	5¢
78	5¢

Augers and Bits—	
Douglas Mfg. Co.	
Wm. A. Ives & Co.	70¢
Humphreysville Mfg. Co.	
French, Swift & Co. (F. H. Beecher)	55¢
Cook's, Douglas Mfg. Co.	50¢
Cook's, N. H. Copper Co.	50¢
Ives' Circular Lip	80¢
Patent Solid Head	30¢
C. E. Jennings & Co., No. 10, extension	40¢
Up	40¢
C. E. Jennings & Co., No. 30	60¢
C. E. Jennings & Co., Auger Bits, 1/2 set, 32 1/4 quaters, No. 5, 25; No. 30, 35.20	45¢
Lewis' Patent Single Twist	45¢
Jennings' Augers and Bits	25¢
Imitation Jennings' Bits	90¢
Peters Black	30¢
Car Bits	50¢
L. Hommedieu Car Bits	15¢
Forster Pat. Aug Bits	10¢

Hollow Augers—

Ives'	25¢
French, Swift & Co.	25¢
Douglass'	25¢
Bonney's Adjustable, 7/8 doz \$48	40¢
Stearns'	20¢
Ives' Expansive, each \$4.50	50¢
Universal Expansive, each \$4.50	20¢
Wood's	25¢

Expansive Bits—

Clark's small, 1/8; large, 3/8	35¢
Ives' No. 4, 7/8 doz \$80	40¢
Swan's	40¢
Stearns, No. 1, 25¢; No. 2, 32¢	35¢
Stearns' No. 2, 48¢	30¢

Gimlet Bits—

Common	7¢
Diamond	11¢
Bee	25¢
Double Cut, Sheppardson's	45¢
Double Cut, Ct. Valley Mfg. Co.	30¢
Double Cut, Hartwell's, 7/8 gro.	40¢
Double Cut, Douglass'	40¢
Double Cut, Ives'	60¢

Bit Stock Drills—

Morse Twist Drills	50¢
Standard	50¢
Cleveland	50¢
Syracuse, for metal	50¢
Syracuse, for wood (wood list)	30¢
Williams' or Holt's, for metal	50¢
Williams' or Holt's, for wood	40¢

Ship Augers and Bits—

L'Hommiedieu's	15¢
Watrous'	15¢
Snell's	15¢
Snell's Ship Auger Pat'n Car Bits	15¢

Awl Hafts—

Sewing, Brass Fer. 7/8 gr. \$3.50	45¢
Pat. Sewing, Short \$1.00 7/8 doz	40¢
Pat. Sewing, Long	40¢
Pat. Peg, Plain Top, 7/8 gr. \$10.00	45¢
Pat. Peg, Leather Top, 7/8 gr. \$12.00	45¢

Awls, Brad Sets, &c—

Awls, Sewing, Common 7/8 gr. \$1.70	35¢
Awls, Should. Peg 7/8 gr. \$2.45	40¢
Awls, Pat. Peg, 7/8 gr. \$3.45	40¢
Awls, Shouldered Brad, 2 7/8 gr.	35¢
Awls, Handled Brad, 7/8 gr.	45¢
Awls, Handled Scratch 7/8 gr. \$7.50	35¢
Awls, Socket Scratch, 7/8 doz, \$1.50	25¢

Awl and Teel Sets—

Alken's Sets, Awls and Tools	
No. 20, 7/8 doz \$10.00	55¢
Fray's Adj. Tool Hdlr., Nos. 1, 12; 2, 18	12¢
3, 12; 4, 18	25¢
Miller's Falls Adj. Tool Hdlr.	
Nos. 1, 12; 2, 18	25¢
Henry's Combination Haft, 7/8 doz \$6.50	
Brad Sets	
No. 42, \$10.50; No. 43, \$12.50	70¢
Stanley's Excelsior	
No. 1, \$7.50; No. 2, \$4.00; No. 3, \$5.50	30¢

Axes—

Makers' and Special Brands—	
First quality	7¢
Others	5¢

Axle Grease—

Fraser's, in Keg 7/8 4¢, Pail 7/8 5¢	
Fraser's, in boxes	5¢
Dixon's Everlasting, in bx.	10¢
10¢; 2 1/2 doz \$2.00	
Dixon's Everlasting, 10¢ pails, ea. 8¢	
Lower grades, special brands	7¢

Axles—

No. 1	4¢
Nos. 7 to 14	5¢
Nos. 15 to 18	47¢
Nos. 19 to 22	70¢
National Tubular Self-Oiling Standard Farm (1 to 5) and Special Farm (A1 to A5)	
Less than 10 sets	33¢
Over 10 sets	33¢

Bag Holders—

Sprengle's Pat.	7¢
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Balances—

Spring Balances	50¢
Common 24-lb	50¢
Chatillon's Spring Balances	50¢
Chatillon's Circular Spring Balances	80¢

Bells—

Hand—

Light Brass	70¢
Extra Heavy	60¢
White Metal	60¢
Silver Chime	33¢
Globe (Cone's Patent)	25¢

Door—

Gong, Abbe's	33¢
Gong, Yankee	45¢
Gong, Benson's	40¢
Crank, Taylor's	25¢
Crank, Brooks'	50¢
Crank, Cone's	10¢

Crank, Connel's	30¢
Lever, Sargent's	50¢
Lever, Taylor's Bronzed or Plated	50¢
Lever, Taylor's Japanned	35¢
Lever, R. E. M. Co.'s	50¢
Pull, Brook's	50¢
Pull, Western	25¢

Cow—

Common Wrought	60¢
Western	30¢
Western, Sargent's list	70¢
Kentucky, "Star"	30¢
Kentucky, Sargent's list	70¢
Dodge, Genuine Kentucky	70¢
Texas Star	50¢
Call	40¢
Farm Bells	7¢
Steel Alloy Church and School Bells	40¢

Bellows—

Blacksmiths'	50¢
Molders'	40¢
Hand Bellows	40¢

Belting, Rubber—

Common Standard	70¢
Standard	70¢
Extra	60¢
N. Y. B. & P. Co., Carbon	60¢
N. Y. B. & P. Co., Diamond	50¢

Bench Steps—

Morrill's	7¢
Hotchkiss's	7¢
Weston's, No. 1, \$10; No. 2, \$9.25	10¢
McGill's	7¢

Bits—

Auger, Gimlet, Bit Stock, Drills, &c.	
See Augers and Bits.	

Bit Holders—

Extension	
Barber's, 7/8 doz \$15.00	40¢
Ives, 7/8 doz \$20.00	60¢
Diagonal	7¢
Angular	7¢

Blind Adjusters—

Domestic	7¢
Excelsior	7¢
Washburn's Self-Locking	20¢

Blind fasteners—

Mackrell's, 7/8 doz, \$1.00	20¢
Van Sand's Screw Pat., \$15 gr.	60¢
Van Sand's Old Pat., \$15.00 gr.	55¢
Washburn's Old Pattern	50¢
Merriman's	new list
Austin & Eddy No. 3008	30¢
Security Gravity	30¢

Blind Staples—

Barbed, 1/2 in. and larger	7¢
Barbed, 3/4 in.	5¢

Blocks—

Cleveland Block Co., Mal. Iron	50¢
Moore's Novelty, Mal. Iron	50¢

Belts—

Door and Shutter—	
Cast Iron Barrel, Square, &c.	70¢
Cast Iron Shutter Bolts	70¢
Cast Iron Chain (Sargent's list)	65¢
Ives' Patent Door Bolts	60¢
Wrought Barrel	70¢
Wrought Square	70¢
W. R. Shutter, all Iron, Stanley's	60¢
W. R. Shutter, Brass Knob	40¢
W. R. Shutter, Sargent's list	60¢
W. R. Sunk Flush, Sargent's list	55¢
W. R. Sunk Flush, Stanley's list	50¢
W. R. Sunk Flush, Com'n	55¢

Carriage, Machine, &c.—

Com. list June 10, '84	75¢
Genuine Eagle, list Oct. '84	75¢
Phila. pattern, list Oct. 7, '84	75¢
R. B. & W., old list	75¢
Machine, according to size	75¢
Bolt Ends, according to size	75¢

Tire—

Common, list Feb. 23, '83	70¢
Portchester Bolt and Nut Company	
Empire, list Feb. 23, '83	70¢
Phila., list Oct. '84	82¢
Keystone, Philadel., list Oct. '84	80¢
Norway, Phila., list Oct. '84	75¢
American Screw Company	
Norway, Phila., list Oct. 16, '84	75¢
Eagle, Phila., list Oct. 16, '84	80¢
Phila., list Oct. 16, '84	82¢
Bay State, list Feb. 23, '83	70¢
R. B. & W., Philadel., list Oct. 16, '84	82¢
R. E. Mfg. Co.	70¢

Stove and Plow—

Stove	65¢
Flow	60¢
R. B. & W., Plow	65¢

Borax—

Borax	7¢
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Boring Machines—

Without Augers.	
Douglas	5.50
Snell's, Rice's Pat.	6.75
Jennings	6.50
Other Machines	2.35
With Augers.	
Phillips' Patent	7.00
with Augers	7.50

Bow Pins—

Humason, Beckley & Co.'s	50¢
Sargent & Co.'s	50¢
Peck, Stow & W. Co.	50¢

Braces—

Barber's	
Nos. 10 to 16	50¢
Nos. 30 to 35	50¢
Nos. 40 to 65	50¢
Barker's	
Nos. 8, 10 and 12	75¢
Plated, Nos. 8, 10 and 12	85¢
Osgood's Ratchet	40¢
Spottford's	50¢
Ives' New Haven Novelty	70¢
New Haven Ratchet	60¢
Barber Ratchet	60¢
Barbers	60¢
Spottford	60¢
Common Ball, American	1.10
Bartholomew's	
Nos. 25, 27 and 30	50¢
Nos. 117, 118, 119	70¢
Amidon's	
Barker's Imp'd Plain	75¢
Barker's Imp. Nickel	55¢
Ratchet	75¢
Eclipse Ratchet	60¢
Globe Jawed	40¢
Corner Brace	40¢
Universal, 8 in., 10 in.	35¢
Buffalo Ball	1.10
P. S. & W.	50¢

Cards— Horse & Curry.....10¢10¢10¢10¢ Cotton.....New List, Aug., 1883. Wool.....New List, Aug., 1883. 10¢10¢10¢ 10¢10¢10¢	Carpet Stretchers— Cast Steel, Polished..... 5 doz \$2.25 Cast Iron, Steel Points..... 5 doz \$2.00 Socket..... 5 doz \$1.75 Bullard's..... 25¢25¢10¢	Carpet Sweepers— Bissell No. 5..... 5 doz \$17.00 Bissell No. 7 New Drop Pan..... 5 doz \$19.00 Bissell, Grand..... 5 doz \$36.00 Grand Rapids..... 5 doz \$24.00 Crown Jewel, No. 1, \$18.00; No. 2, \$19.00; No. 3, \$20.00 Magic..... 5 doz \$15.00 Jewel..... 5 doz \$17.00 Improved Parlor Queen, Nickel..... 5 doz \$27.00 Improved Parlor Queen, Japanese..... 5 doz \$24.00 Excelsior..... 5 doz \$22.00 Garland..... 5 doz \$18.00 Parlor Queen..... 5 doz \$24.00 Housewife's Delight..... 5 doz \$18.00 Queen..... 5 doz \$18.00 Queen, with band..... 5 doz \$18.00 King..... 5 doz \$30.00 Weed, Improved..... 5 doz \$18.00 Cog-Wheel..... 5 doz \$16.00 Conqueror..... 5 doz \$22.00 Easy..... 5 doz \$22.00 Monarch..... 5 doz \$22.00 Goshen..... 5 doz \$21.00 Advance..... 5 doz \$18.00 Ladies' Friend, No. 1, 5 doz \$15.00; No. 2..... 5 doz \$16.00 American..... 5 doz \$15.00 Grand Republic..... 5 doz \$36.00	Cartridges— See Ammunition.	Casters— Bed.....New List: Plate.....55¢55¢5 Shallow Socket.....60¢60¢5 Deep Socket.....60¢60¢5 Yale Casters, List May, 1884.....30¢10¢40 Yale, Gem.....60¢60¢5 Martin's Patent (Phoenix).....45¢10¢50 Payson's Anti-Friction.....60¢60¢10 Giant Truck Casters.....30¢ Stationary Truck Casters.....60¢10 Socket Truck Casters.....60¢	Cattle Leaders— Humason, Beckley & Co.'s.....70¢ Sargent's.....60¢10 Hotchkiss.....30¢ Peck, Stow & W. Co.....60¢10 Chain— Trace, 6-10-2, exact.....50¢10¢50 Trace, 6-10-3, exact.....50¢10¢50 Trace, 6-10-4, exact.....50¢10¢50 Trace, 7-10-2, exact.....50¢10¢50 Trace, 7-10-3, exact.....50¢10¢50 Trace, 7-10-4, exact.....50¢10¢50 Trace, 7-10-5, exact.....50¢10¢50 Trace, 7-10-6, exact.....50¢10¢50 Trace, 7-10-7, exact.....50¢10¢50 Trace, 7-10-8, exact.....50¢10¢50 Trace, 7-10-9, exact.....50¢10¢50 Trace, 7-10-10, exact.....50¢10¢50 Trace, 7-10-11, exact.....50¢10¢50 Trace, 7-10-12, exact.....50¢10¢50 Trace, 7-10-13, exact.....50¢10¢50 Trace, 7-10-14, exact.....50¢10¢50 Trace, 7-10-15, exact.....50¢10¢50 Trace, 7-10-16, exact.....50¢10¢50 Trace, 7-10-17, exact.....50¢10¢50 Trace, 7-10-18, exact.....50¢10¢50 Trace, 7-10-19, exact.....50¢10¢50 Trace, 7-10-20, exact.....50¢10¢50 Trace, 7-10-21, exact.....50¢10¢50 Trace, 7-10-22, exact.....50¢10¢50 Trace, 7-10-23, exact.....50¢10¢50 Trace, 7-10-24, exact.....50¢10¢50 Trace, 7-10-25, exact.....50¢10¢50 Trace, 7-10-26, exact.....50¢10¢50 Trace, 7-10-27, exact.....50¢10¢50 Trace, 7-10-28, exact.....50¢10¢50 Trace, 7-10-29, exact.....50¢10¢50 Trace, 7-10-30, exact.....50¢10¢50 Trace, 7-10-31, exact.....50¢10¢50 Trace, 7-10-32, exact.....50¢10¢50 Trace, 7-10-33, exact.....50¢10¢50 Trace, 7-10-34, exact.....50¢10¢50 Trace, 7-10-35, exact.....50¢10¢50 Trace, 7-10-36, exact.....50¢10¢50 Trace, 7-10-37, exact.....50¢10¢50 Trace, 7-10-38, exact.....50¢10¢50 Trace, 7-10-39, exact.....50¢10¢50 Trace, 7-10-40, exact.....50¢10¢50 Trace, 7-10-41, exact.....50¢10¢50 Trace, 7-10-42, exact.....50¢10¢50 Trace, 7-10-43, exact.....50¢10¢50 Trace, 7-10-44, exact.....50¢10¢50 Trace, 7-10-45, exact.....50¢10¢50 Trace, 7-10-46, exact.....50¢10¢50 Trace, 7-10-47, exact.....50¢10¢50 Trace, 7-10-48, exact.....50¢10¢50 Trace, 7-10-49, exact.....50¢10¢50 Trace, 7-10-50, exact.....50¢10¢50 Trace, 7-10-51, exact.....50¢10¢50 Trace, 7-10-52, exact.....50¢10¢50 Trace, 7-10-53, exact.....50¢10¢50 Trace, 7-10-54, exact.....50¢10¢50 Trace, 7-10-55, exact.....50¢10¢50 Trace, 7-10-56, exact.....50¢10¢50 Trace, 7-10-57, exact.....50¢10¢50 Trace, 7-10-58, exact.....50¢10¢50 Trace, 7-10-59, exact.....50¢10¢50 Trace, 7-10-60, exact.....50¢10¢50 Trace, 7-10-61, exact.....50¢10¢50 Trace, 7-10-62, exact.....50¢10¢50 Trace, 7-10-63, exact.....50¢10¢50 Trace, 7-10-64, exact.....50¢10¢50 Trace, 7-10-65, exact.....50¢10¢50 Trace, 7-10-66, exact.....50¢10¢50 Trace, 7-10-67, exact.....50¢10¢50 Trace, 7-10-68, exact.....50¢10¢50 Trace, 7-10-69, exact.....50¢10¢50 Trace, 7-10-70, exact.....50¢10¢50 Trace, 7-10-71, exact.....50¢10¢50 Trace, 7-10-72, exact.....50¢10¢50 Trace, 7-10-73, exact.....50¢10¢50 Trace, 7-10-74, exact.....50¢10¢50 Trace, 7-10-75, exact.....50¢10¢50 Trace, 7-10-76, exact.....50¢10¢50 Trace, 7-10-77, exact.....50¢10¢50 Trace, 7-10-78, exact.....50¢10¢50 Trace, 7-10-79, exact.....50¢10¢50 Trace, 7-10-80, exact.....50¢10¢50 Trace, 7-10-81, exact.....50¢10¢50 Trace, 7-10-82, exact.....50¢10¢50 Trace, 7-10-83, exact.....50¢10¢50 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7-10-112, exact.....50¢10¢50 Trace, 7-10-113, exact.....50¢10¢50 Trace, 7-10-114, exact.....50¢10¢50 Trace, 7-10-115, exact.....50¢10¢50 Trace, 7-10-116, exact.....50¢10¢50 Trace, 7-10-117, exact.....50¢10¢50 Trace, 7-10-118, exact.....50¢10¢50 Trace, 7-10-119, exact.....50¢10¢50 Trace, 7-10-120, exact.....50¢10¢50 Trace, 7-10-121, exact.....50¢10¢50 Trace, 7-10-122, exact.....50¢10¢50 Trace, 7-10-123, exact.....50¢10¢50 Trace, 7-10-124, exact.....50¢10¢50 Trace, 7-10-125, exact.....50¢10¢50 Trace, 7-10-126, exact.....50¢10¢50 Trace, 7-10-127, exact.....50¢10¢50 Trace, 7-10-128, exact.....50¢10¢50 Trace, 7-10-129, exact.....50¢10¢50 Trace, 7-10-130, exact.....50¢10¢50 Trace, 7-10-131, exact.....50¢10¢50 Trace, 7-10-132, exact.....50¢10¢50 Trace, 7-10-133, exact.....50¢10¢50 Trace, 7-10-134, exact.....50¢10¢50 Trace, 7-10-135, exact.....50¢10¢50 Trace, 7-10-136, exact.....50¢10¢50 Trace, 7-10-137, exact.....50¢10¢50 Trace, 7-10-138, exact.....50¢10¢50 Trace, 7-10-139, exact.....50¢10¢50 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Trace, 7-10-472, exact.....50¢10¢50 Trace, 7-10-473, exact.....50¢10¢50 Trace, 7-10-474, exact.....50¢10¢50 Trace, 7-10-475, exact.....50¢10¢50 Trace, 7-10-476, exact.....50¢10¢50 Trace, 7-10-477, exact.....50¢10¢50 Trace, 7-10-478, exact.....50¢10¢50 Trace, 7-10-479, exact.....50¢10¢50 Trace, 7-10-480, exact.....50¢10¢50 Trace, 7-10-481, exact.....50¢10¢50 Trace, 7-10-482, exact.....5
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Cross-Cut Saw Handles— Atkins' No. 1 Loop, pair, 30¢; No. 3, 22¢; No. 2 and No. 4 Reversible, 22¢. Boynton's Loop Saw Handles, 50¢. 80¢ Champion..... 10¢		Clark's, Nos. 1, 3, 5, 40 and 50..... 75¢10¢50¢80¢ Clark's Mortise Gravity..... 50¢ Sargent's, Nos. 1, 3, 5, 11, 13..... 75¢10¢75¢10¢25¢ Reading's Gravity..... 75¢10¢75¢10¢25¢ Shepard's..... 75¢10¢25¢ Noiseless..... 75¢10¢25¢ Niagara..... 80¢25¢ Buffalo..... 80¢25¢ Clark's Genuine Pat..... 80¢25¢ O. S. Lull & Porter..... 75¢10¢ Acme, Lull & Porter..... 75¢10¢ Queen City Reversible..... 75¢ Clark's Lull & Porter, Nos. 0, 1, 1½, 2, 3, 4, 8..... 75¢10¢25¢ North's Automatic Blind Fixtures, No. 2 for Wood, \$10.50; No. 3, for Brick, \$13.50..... 25¢25¢		New Haven..... 23¢ 26¢ 25¢ 24¢ 23¢ Saranac..... 23¢ 21¢ 20¢ 19¢ 18¢..... 30¢10¢ Champion..... 25¢ 23¢ 22¢ 21¢ 20¢..... 10¢10¢10¢ Capewell..... 23¢ 21¢ 20¢ 19¢ 18¢..... 35¢5¢35¢10¢ Star..... 23¢ 21¢ 20¢ 19¢ 18¢..... 10¢10¢10¢12¢14¢ Anchor..... 23¢ 21¢ 20¢ 19¢ 18¢..... 35¢ Western..... 23¢ 21¢ 20¢ 19¢ 18¢..... 40¢10¢ Empire Bronzed..... 14¢ 1¢ 1¢ Horse Shoes—See Shoes Horse.		Locks, &c.— Door Locks, Latches, &c. List Dec. 30, '86, chgd Feb. 2, '87..... 50¢10¢60¢5¢ Mallory, Wheeler & Co., list July, '88..... 60¢10¢60¢ Sargent & Co., list Aug. 1, '88..... 10¢60¢10¢ Reading Hardware Co., list Feb. 2, '88..... 55¢60¢10¢ Livingston & Co..... 70¢ Note.—Lower net prices often made. Perkins' Burglar Proof..... 60¢25¢ Yale, new list..... 85¢25¢ F. Many's "Extension Cylinder" \$10.50 Barnes Mfg. Co..... 40¢40¢10¢ Yale Corrugated Key..... 35¢ Delta Flat Key..... 30¢ L. & C. Round Key Latches..... 30¢10¢ L. & C. Flat Key Latches..... 35¢10¢ Romer's Night Latches..... 15¢ Yale, new list..... 35¢ Shephardson or U. S..... 35¢ Felter or American..... 40¢10¢ Seed's N. Y. Haap Lock..... 25¢ Cabinet— Eagle, Gaylord Par. list March, '84, rev. ker and Corbin..... Jan. 1, '86, 33¢42¢ Delta, Nos. 36 to 39..... 40¢ Delta, Nos. 51 to 53..... 40¢10¢ Delta, Nos. 56 to 58..... 30¢ Stoddard Lock Co..... 30¢33¢4¢ "Champion" Night Latches..... 40¢ Barnes Mfg. Co..... 40¢40¢10¢ Eagle and Corbin Trunk..... 25¢25¢ "Champion" Cab. and Combin..... 33¢4¢ Yale..... 35¢ Romer's..... 25¢ Padlocks— List Dec. 23, '84..... 75¢75¢10¢ Yale Lock Mfg. Co.'s..... 35¢ Eagle..... 25¢ Eureka, Eagle Lock Co..... 40¢35¢ Romer's, Nos. 0 to 91..... 30¢ Romer's Scandinavian, &c., Nos. 100 to 606..... 100¢ 15¢ A. E. Deits..... 40¢ Champion Padlocks..... 40¢ Hotchkiss..... 30¢ Star..... 45¢ Horseshoe..... 40¢ 30¢ 40¢40¢10¢ Barnes Mfg. Co..... 40¢40¢10¢ No. 1's..... 30¢ Brown's Pat..... 25¢ Scandinavian..... 50¢40¢10¢ Frain's Pat. Scandinavian low list..... 60¢ Ames Sword Co. up to No. 150..... 40¢ Ames Sword Co. above No. 150..... 50¢		Ventilator Cord, Samsom Braided, White or Drab Cotton. 75¢ doz \$7.50, 20¢ Locks, &c.— Door Locks, Latches, &c. List Dec. 30, '86, chgd Feb. 2, '87..... 50¢10¢60¢5¢ Mallory, Wheeler & Co., list July, '88..... 60¢10¢60¢ Sargent & Co., list Aug. 1, '88..... 10¢60¢10¢ Reading Hardware Co., list Feb. 2, '88..... 55¢60¢10¢ Livingston & Co..... 70¢ Note.—Lower net prices often made. Perkins' Burglar Proof..... 60¢25¢ Yale, new list..... 85¢25¢ F. Many's "Extension Cylinder" \$10.50 Barnes Mfg. Co..... 40¢40¢10¢ Yale Corrugated Key..... 35¢ Delta Flat Key..... 30¢ L. & C. Round Key Latches..... 30¢10¢ L. & C. Flat Key Latches..... 35¢10¢ Romer's Night Latches..... 15¢ Yale, new list..... 35¢ Shephardson or U. S..... 35¢ Felter or American..... 40¢10¢ Seed's N. Y. Haap Lock..... 25¢ Cabinet— Eagle, Gaylord Par. list March, '84, rev. ker and Corbin..... Jan. 1, '86, 33¢42¢ Delta, Nos. 36 to 39..... 40¢ Delta, Nos. 51 to 53..... 40¢10¢ Delta, Nos. 56 to 58..... 30¢ Stoddard Lock Co..... 30¢33¢4¢ "Champion" Night Latches..... 40¢ Barnes Mfg. Co..... 40¢40¢10¢ Eagle and Corbin Trunk..... 25¢25¢ "Champion" Cab. and Combin..... 33¢4¢ Yale..... 35¢ Romer's..... 25¢ Padlocks— List Dec. 23, '84..... 75¢75¢10¢ Yale Lock Mfg. Co.'s..... 35¢ Eagle..... 25¢ Eureka, Eagle Lock Co..... 40¢35¢ Romer's, Nos. 0 to 91..... 30¢ Romer's Scandinavian, &c., Nos. 100 to 606..... 100¢ 15¢ A. E. Deits..... 40¢ Champion Padlocks..... 40¢ Hotchkiss..... 30¢ Star..... 45¢ Horseshoe..... 40¢ 30¢ 40¢40¢10¢ Barnes Mfg. Co..... 40¢40¢10¢ No. 1's..... 30¢ Brown's Pat..... 25¢ Scandinavian..... 50¢40¢10¢ Frain's Pat. Scandinavian low list..... 60¢ Ames Sword Co. up to No. 150..... 40¢ Ames Sword Co. above No. 150..... 50¢
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Machine—	
Flat Head, Iron.....	55%
Round Head, Iron.....	55%
Bench and Hand—	
Bench, Iron.....	55% to 55% 10 10 10
Bench, Wood, Beech.....	55% to 55% 10 10 10
Bench, Wood, Hickory.....	55% to 55% 10 10 10
Hand, Wood.....	55% to 55% 10 10 10
Lag, Blunt Point.....	55% to 55% 10 10 10
Cosch and Lag, Gimlet Point.....	55% to 55% 10 10 10
Bed.....	55% to 55% 10 10 10
Hand Rail, Sargent's.....	55% to 55% 10 10 10
Hand Rail, H. & B. Mfg. Co.....	55% to 55% 10 10 10
Hand Rail, Am. Screw Co.....	55% to 55% 10 10 10
Jack Screws, Millers Falls list.....	55% to 55% 10 10 10
Jack Screws, P. S. & W.....	55% to 55% 10 10 10
Jack Screws, Sargent's.....	55% to 55% 10 10 10
Jack Screws, Stearns'.....	55% to 55% 10 10 10
Scroll Saws—	
Lester, complete, \$10.00.....	25%
Rogers, complete, \$4.00.....	25%
Barnes' Builders' and Cabinet Makers'.....	25%
\$15.....	25%
Barnes' Scroll Saw Blades.....	25%
Scythe Snaths.....	
50¢ 25%	
Shears—	
American (Cast) Iron.....	75% 10 75% 10 25%
Pruning, See Pruning Hooks and Shears.....	
Barnard's Lamp Trimmers.....	50¢ 25%
Tinners'.....	20¢ 25%
Seymour's, List, Dec. 1881.....	60% 10 60% 10 10 25%
Heinrich's, List, Dec. 1881.....	60% 10 60% 10 10 10 25%
Heinrich's Tailor's Shears.....	33%
First quality C. S. Trimmers.....	30¢ 80% 10 25%
Second quality C. S. Trimmers.....	80% 10 80% 10 10 10 25%
Acme Cast Shears.....	10¢ 10 10 25%
Diamond Cast Shears.....	10¢ 10 10 25%
Clippers.....	10¢ 10 10 25%
Victor Cast Shears.....	75% 10 75% 10 10 25%
Howe Bros. & Hulbert, Solid Forged Steel.....	40%
Chicago Drop Forge & F. Co., Solid Steel Forged.....	70%
Clausen Shear Co., Japaned.....	70%
Clausen Shear Co., Nickel, same list.....	60%
Sheaves—	
Sliding Door—	
M. W. Co., list July, 1888.....	50% 10 50% 10 25%
R. & E., list Dec. 18, 1885.....	55% 20%
Corbin's list.....	60% 10 25%
Patent Roller.....	60% 10 25%
Patent Roller, Hatfield's.....	75%
Russell's Anti-Friction, list Dec. 18, 1885.....	60% 25%
Moore's Anti-Friction.....	50%
Sliding Shutter—	
R. & E. list Dec. 18, 1885.....	60% 10 25%
Sargent's list.....	60% 10 25%
Reading list.....	60% 10 10 25%
Ship Tools—	
L. & I. J. White.....	20% 25%
Albertson Mfg. Co.....	25%
Sheets, Horse, Mule, &c.—	
Horse—	
Burden's, Perkins', Phoenix, at factory.....	\$4.00
Mule—	
Add 1¢ per kg to above prices.	
Oil, Wrought—	
Ton lots.....	50¢ 10 25%
1000 lb lots.....	50¢ 10 25%
500 lb lots.....	50¢ 10 25%
Shot—	
(Eastern prices 2¢ off, cash, 5 days.)	
Drop, 7 bag, 25 lb.....	\$1.20
Drop, 7 bag, 5 lb.....	.20
Buck and Chilled, 7 25-lb bag.....	1.45
Buck and Chilled, 7 5-lb bag.....	.34
Shevels and Spades—	
Ames' Shovels, Spades, &c., list Nov. 1, 1885.....	20%
Norm.—Jobbers frequently give 6¢ 7½¢ extra on above.....	
Griffith's Black Iron.....	50% 10 25%
Griffith's C. S.....	60% 10 25%
Griffith's Solid C. S. R. Goods.....	20%
Old Colony (Sanford Fork & Tool Co.).....	20%
St. Louis Shovel Co.....	20% 25% 7½%
Hussey, Binns & Co.....	15% 25%
Hubbard & Co.....	20% 25% 7½%
Lehigh Mfg. Co.....	50% 10 25%
Payne Pettibone & Son, list January, 1886.....	30%
Remington's (Lowman's Patent).....	30% 10 40%
Rowland's, Black Iron.....	60% 10 25%
Rowland's Steel.....	60% 10 25%
Shovels and Tongs—	
Iron Head.....	60% 10 60% 10 25%
Brass Head.....	60% 10 25%
Skells, Thimble—	
Western list.....	75% 25% 10 1887 30%
Columbus Wrt. Steel, list Nov. 1, 1887.....	30%
Coldbrookdale Iron Co.....	50% 10 25%
Utica P. S. T. Skells.....	60%
Utica Turned and Fitted.....	25%
Sieves—	
Buffalo Metallic, S. S. & Co.....	50% 25% 10 25%
Barley Flour Sievers.....	50¢ 25%
Electric.....	50¢ 25%
Hunter's.....	50¢ 25%
Smith's Adjustable Sievers.....	50¢ 25%
Smith's Adjustable Milk Strainer.....	50¢ 25%
Smith's Adjustable T. & C. Strainer.....	50¢ 25%
Sieves, Wooden Rim—	
Mesh 18, Nested, 7 doz.....	70¢ 90%
Mesh 20, Nested, 7 doz.....	85¢ 11.00
Mesh 24, Nested, 7 doz.....	1.00 1.10
Slates—	
School, by case.....	50% 10 25%
Snaps, Harness, &c.—	
Anchor (T. & S. Mfg. Co.).....	65%
Fitch's (Bristol).....	60% 10 25%
Hutchins.....	10%
Andrews.....	50%
Sargent's Patent Guarded.....	70% 10 25%
German, new list.....	40% 10 25%
Covert, New Patent.....	50% 25%
Covert, New E. E.....	60% 25%
Covered Spring.....	80% 10 25%
Soldering Irons—	
Covert's Adjustable, list Jan. 1, 1886.....	35% 25%
Spoke Shaves—	
Iron.....	45%
Wood.....	30%
Bailey's (Stanley R. & L. Co.).....	40% 10 25%
Stearns'.....	20% 10 30%
Spoke Trimmers—	
Bonney's.....	50¢ 10.00, 50%
Stearns'.....	20% 10 25%
Ives', No. 1, \$15.00; No. 2, \$12.00 per doz.....	55% 10 25%
Douglas'.....	50¢ 25%
Spoons and Forks—	
Tinned Iron—	
Basting, Cen. Stamp. Co.'s list.....	70% 10 25%
Solid Table and Tea, Cen. Stamp. Co.'s list.....	70% 10 25%
Buffalo S. S. & Co.....	35% 25%
Silver-Plated—(4 mos. or 5¢ cash 30 days.)	
Meriden Brit. Co., Rogers.....	50%
C. Rogers & Bros.....	50%
Rogers & Bro.....	50%
Reed & Barton.....	50%
Wm. Rogers Mfg. Co.....	50% 10 25%
Simpson, Hall, Miller & Co.....	50% 10 25%
Holmes & Edwards Silver Co.....	50% 10 25%
Silver Plated.....	50% 10 25%
No. 67 Mexican Silver.....	50% 10 25%
No. 30 Silver Metal.....	50% 10 25%
No. 24 German Silver.....	50%
No. 50 Nickel Silver.....	50% 10 25%
No. 49 Nickel Silver.....	50% 10 25%
German Silver.....	50% 50% 25%
German Silver, Hall & Elton.....	50% 25% cash
Nickel Silver.....	50% 25% 50% 10 25% cash
Britannia.....	60%
Boardman's Flat Ware.....	50% 10 25%
Boardman's Nickel.....	50%
Boardman's Britannia Spoons, case.....	60%
Springs—	
Elliptic, Concord, Platform and Half Scroll.....	60% 60% 25%
Cliff's Bolster Springs.....	25%
Squares—	
Steel and Iron.....	75% 10 80%
Nickel Plated.....	75% 10 80%
Try Square and T Bevels.....	50% 10 10 25%
Diston's Try Square and T Bevels.....	45% 10 25%
Winterbottom's Try and Miter.....	30% 10 25%
Starrett's Micrometer Calliper Squares.....	25%
Avery's Flush Bevel Squares.....	30% 25%
Staples—	
Fence Staples, Galvanized.....	Same price
Fence Staples, Plain.....	as P. R. W. Rep.
Steelyards.....	
40% 10 25%	
Stocks and Dies—	
Blacksmith's	
Waterford Goods.....	30% 25% 30% 10 25%
Butterfield's Goods.....	30% 25% 30% 10 25%
Lightning Screw Plate.....	25% 30%
Reece's New Screw Plates.....	33% 25% 40%
Stone—	
Hindustan No. 1, 8¢; Axe, 3¢; Slips No. 1, 4¢.....	
Sand Stone.....	20% 25%
Washita Stone, Extra.....	15¢ 20%
Washita Stone, No. 1.....	10¢ 15%
Washita Stone, No. 2.....	10¢ 15%
Washita Stone, No. 1, Extra.....	30% 35%
Washita Slips, No. 1.....	24% 25%
Arkansas Stone, No. 1, 4 to 6 in.....	15¢
Arkansas Stone, No. 1, 6 to 9 in.....	15¢
Turkey Oil Stone, 4 to 8 in.....	40%
Turkey Slips.....	10¢ 15%
Lake Superior Chases.....	15%
Lake Superior Slips, Chase.....	31% 35%
Seneca Stone, Red Paper Brand.....	15¢ 20%
Seneca Stone, High Rounds.....	20% 25%
Seneca Stone, Small Whets.....	20% 25%
Stove Polish—	
Joseph Dixon's.....	50¢ 10 25%
Gold Medal.....	50¢ 10 25%
Mirror.....	50¢ 10 25%
Lustro.....	50¢ 10 25%
Ruby.....	50¢ 10 25%
Rising Sun, 5 gro lots.....	50¢ 10 25%
Dixon's Plumbees.....	50¢ 10 25%
Boynton's Noon Day.....	13.00
Parlor Pride Stove Enamel.....	50¢ 10 25%
Yates' Liquid.....	50¢ 10 25%
Yates' Standard Paste Polish, 10-lb cans.....	50¢ 10 25%
Jet Black.....	50¢ 10 25%
Lapane.....	50¢ 10 25%
Priside.....	50¢ 10 25%
Diamond O. K. Enamel.....	50¢ 10 25%
Bonnell's Liquid Stove Polish.....	50¢ 10 25%
Bonnell's Paste Stove Polish.....	50¢ 10 25%
Black Eagle Benzine Paste, 5 and 10 lb cans.....	12%
Black Jack Water Paste, 5 and 10 lb cans.....	12%
Nickel Plate Paste.....	50¢ 10 25%
Tacks, Brads, &c.—	
List, Jan. 2, 1888.—[Note.—Some manufacturers are selling Tacks at slightly higher prices than those named:]	
American Iron Carpet.....	80% 80% 25%
Steel Carpet.....	80% 80% 25%
Swedes Iron Carpet.....	80% 80% 25%
American Iron Cut.....	75% 75% 10 25%
Swedes Iron.....	75% 75% 10 25%
Swedes Iron, Upholsterers'.....	75% 75% 10 25%
Tinned Swedes Iron.....	75% 75% 10 25%
Tinned Swedes Iron, Upholsterers'.....	75% 75% 10 25%
Gimp and Lace.....	75% 75% 10 25%
Tinned Gimp and Lace.....	75% 75% 10 25%
Swedes Iron Trimmers.....	75% 75% 10 25%
Swedes Iron Miners'.....	75% 75% 10 25%
Swedes Iron Bill Posters' or Railroad.....	75% 75% 10 25%
Swedes Steel (Swedes Iron price list).....	80% 80% 25%
Copper Tacks.....	50% 10 25%
Copper Finishing, Trunk and Closets.....	50% 10 25%
Finishing Nails.....	70% 10 25%
Trunk and Clout Nails.....	70% 10 25%
Tinned Trunk and Clout Nails.....	70% 10 25%
Basket Nails.....	70% 10 25%
Common and Patent Brads, 70% 10 70% 25%	
Hungarian Nails.....	
70% 10 70% 10 25%	
Chair Nails.....	70% 10 70% 10 25%
Zinc Glaziers' Points.....	50% 50% 25%
Cigar Box Nails.....	50% 10 50% 10 25%
Picture-Frame Points.....	50% 10 50% 10 25%
Looking-Glass Tacks.....	50% 10 50% 10 25%
Leathered Carpet.....	50% 10 50% 10 25%
Brush Tacks.....	50% 10 50% 10 25%
Shoe Finders, list Jan. 2, 1888.....	10% 10 25%
Lining and Saddle Nails, list Jan. 1, 1888.....	30% 10 10 25%
Silvered.....	30% 10 10 25%
Japanned.....	20% 10 10 25%
Double-Pointed Tacks.....	50%
Wire Carpet Nails.....	50% 10 25%
Wire Brads & Nails, see Nails, Wire.....	
Steel Wire Brads, R. & E. Mfg. Co.'s list.....	50% 10 25%
Tap Borers—	
Common and Rind.....	20% 10 25%
Ive's Tap Borer.....	33% 25%
Enterprise Mfg. Co.....	30% 10 30%
Clark's.....	33% 25%
Tapes, Measuring—	
American.....	25% 10 25%
Spring.....	40%
Chesterman's, Regular list.....	25% 30%
Thermometers—	
Tin Case.....	80% 80% 10 25%
Thimble Skells—See Skells.	
Ties, Bale—Steel	
Standard Wire, list.....	50% 10 25%
Tinners' Shears, &c.—	
Shears and Snips (P. S. & W.).....	20% 25%
Punches, see Punches.....	
Snips, J. Mallinson & Co.....	33%
Tinware—	
Stamped, Japaned and Plated, list Jan. 20, 1887.....	75% 75% 25%
Tire Benders, Upsetters, &c.—	
Stoddard's Lightning Tire Upsetters.....	15%
Detroit Perfected Tire Bender.....	15%
Tobacco Cutters—	
Champion.....	20% 10 30%
Wood Bottom.....	50¢ 25% 50% 25%
All Iron.....	50¢ 25%
Nashua, Lock Co.'s.....	50¢ 25%
Wilson's.....	50¢ 25%
Sargent's.....	50¢ 25%
Acme.....	50¢ 25%
Transom Lifters—	
Wollensak's:	
Class 3 and 4, Bronzed Iron.....	50%
Class 3 and 4, Bronze Metal.....	25%
Class 3 and 4, Brass.....	35%
Skylight Lifters.....	35%
Crown, Eagle and Shield.....	50%
Reiher's, list Jan. 1, 1887.....	50% 10 25%
Bronzed Iron Rods.....	50% 10 25%
Brass, Real Bronze or Nickel Plate.....	30%
Excelsior.....	50% 10 25%
Shaw's.....	50% 10 25%
Payson's Universal.....	40% 40% 10 25%
Traps—	
Game—	
Newhouse.....	35% 40% 25%
Onelda Pattern.....	70% 70% 25%
Game, Blake's Patent.....	40% 10 25%
Mouse and Rat—	
Mouse Wood Choker.....	50¢ 10 12%
Mouse, Round Wire.....	50¢ 10 12%
Mouse, Cage Wire.....	50¢ 10 12%
Mouse, Catch 'em alive.....	50¢ 10 12%
Mouse, "Bonanza".....	50¢ 10 12%
Mouse, Delusion.....	50¢ 10 12%
Rat, "Decoy".....	50¢ 10 12%
Ideal.....	50¢ 10 12%
Cyclone.....	50¢ 10 12%
Hutchins Metallic Mouse, 6-hol traps.....	50¢ 10 12%
In full cases.....	50¢ 10 12%
Trowels—	
Lothrop's Brick and Plastering.....	25%
Rose's Brick and Plastering.....	25%
Diston's Brk and Plastering.....	25% 25% 10 25%
Peace's Plastering.....	25%
Clement & Maynard's.....	20%
Rose's Brick.....	15% 20%
Brade's Brick.....	25%
Worrall's Brick and Plastering.....	20%
Garden.....	70%
Triers—	
Butter and cheese.....	25%
Trucks, Warehouse, &c.—	
B. & L. Block Co.'s list '82.....	40%
Tubes, Boiler—	
See Pipe.....	
Twine—	
Flax Twine—	
No. 9, 4 and 1/2 B Balls.....	22¢ 30%
No. 12, 4 and 1/2 B Balls.....	21¢ 29%
No. 18, 4 and 1/2 B Balls.....	18¢ 28%
No. 24, 4 and 1/2 B Balls.....	18¢ 28%
No. 36, 4 and 1/2 B Balls.....	16¢ 27%
No. 48, 4 and 1/2 B Balls.....	14¢ 25%
Chalk Line, Cotton, 1/2 B Balls.....	25%
Mason Line, Linen, 1/2 B Balls.....	55%
2-Ply Hemp, 1/2 and 1/4 B Balls (Spring Twine).....	11¢
3-Ply Hemp, 1/2 B Balls.....	12¢ 12%
3-Ply Hemp, 1/4 B Balls.....	11¢ 11%
Cotton Wrapping, 5 Balls to lb.....	15¢ 16%
2, 3 and 5-Ply Jute, 1/2 B Balls.....	10¢
Wool.....	6¢ 6%
Paper.....	13¢ 14%
Cotton Mops, 6, 9, 12 and 15 lb to doz.....	18%
Vises—	
Solid Box.....	60% 90% 25%
Parallel—	
Fisher & Norris Double Screw.....	15% 10%
Stephens'.....	25% 30%
Parker's.....	
30% 25%	
Wilson's.....	55%
Howard's.....	40%
Bonney's.....	40% 10%
Millers Falls.....	40% 40% 10%
Trenton.....	40% 5% 40% 10%
Merrill's.....	15% 20%
Sargent's.....	60% 10 10%
Backus and Union.....	15% 10%
Double Screw Leg.....	20% 25%
Prentiss.....	20% 25%
Simpson's Adjustable.....	40%
Moore's.....	20%

THE IRON AGE

THURSDAY, MARCH 28, 1889.

Horizontal Boring, Turning and Milling Machine.

The machine of which we herewith present a perspective and cross sectional view is designed for general use in manufacturing and repair shops; it may be used for boring and drilling, as a turning lathe, and as a milling machine on large work. When used as a boring mill, the large flat table upon which to bolt work facilitates the setting, as it is necessary to consider but one point at a time. When bolted to the table the cross-wire adjustment permits of accurately reaching the desired line horizontally, while the up-and-down adjustment of the head and tail spindles provides for vertical alignment. When, as is frequently the case, the distances required are from planed base and side, the measurements can be made and fixed before the work is placed on the table. When a drill chuck is substituted for the

driven from a pinion upon a cone shaft. Back gears furnish ample power for heavy work. A pulley outside the pinion on the main spindle drives an intermediate shaft, upon which a cone is arranged to drive the gear of the feed-screw for operating the apron. Through suitable gearing the carriage is moved laterally and the table crosswise. The carriage is provided with clamps for binding in position when milling is being done. This machine is made by Nicholson & Waterman, of Providence, R. I.

The Duty on Fancy Nails.

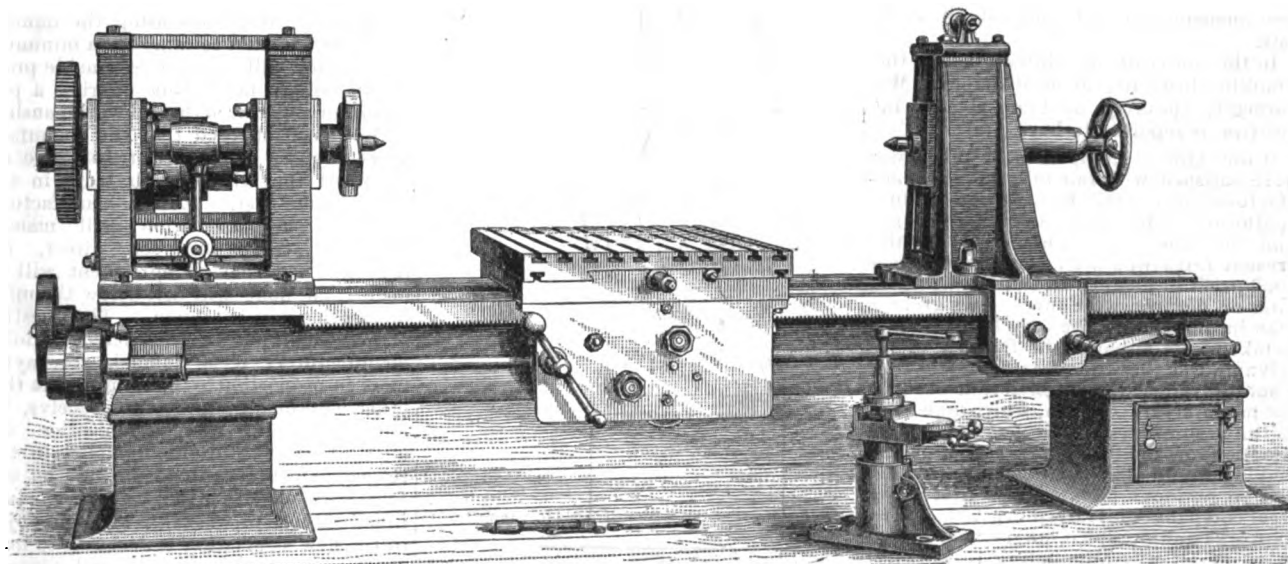
The Treasury Department, acting under a decision in a suit brought for the recovery of alleged excessive duties exacted on certain brass-headed and gilt-headed nails, holds as follows:

The United States attorney reports that the importations in question were of two

the rate upon "britannia ware and plated and gilt articles and wares of all kinds."

With regard to the nails first above mentioned—viz., those which were not treated with any overlaying substance to give them the gilt appearance—a judgment was rendered in favor of the defendant, while with regard to the second class of nails, which were found to be actually gilded, the jury found for the plaintiffs, and to be dutiable at the rate of 35 per cent. ad valorem, as gilt articles, under paragraph 210.

It is also understood that the trial in question was a retrial of the case, with a similar result in effect to that of the first trial. Upon submitting the matter to the United States Attorney-General, that officer certifies that no appeal or writ of error will be taken by the United States from the judgment of the Circuit Court. The Department, therefore, concurring in said judgment, authorizes the Collector to



HORIZONTAL BORING, TURNING AND MILLING MACHINE.—NICHOLSON & WATERMAN.

face-plate the machine is adapted for drilling holes in large pieces. By means of the cross-traverse of the table and the up-and-down feed of the head a hole can be located anywhere in a space 27 x 36 inches on the 48-inch swing machine. The mill is converted into a swing lathe when provided with a turning rest, and will then perform all the work of a lathe except screw cutting, which feature can be added if necessary. By means of the cross-traverse feed of the table and the power-feed connected to it large pieces can be milled.

The bed of the machine measures 12 feet in length. Both the head and tail spindles can be adjusted up and down. The latter is moved lengthwise in its box, which is fitted to the sliding frame, and is moved vertically by means of a screw and gears operated from the top of the frame. The frame is moved laterally by rack and pinion connection. The front spindle runs in two long and large bronze taper take-up boxes fitted to boxes which are adjustable up and down in the frame, which is stationary. The spindle passes through a center sleeve, to which the elevating screw is attached; the screw passes through a nut in one of two bevel gears operated by wrench. The outer end of the spindle is fitted with a large gear

general kinds; first, small nails with large brass heads, such as are used in upholstering furniture, the heads of which were not treated with any overlaying substance, but got their gilt appearance from the brass out of which they were made, being subjected to a lacquering process which enhanced their luster, but did not change their color; second, a line of nails with much larger heads, in fancy shapes, such as crosses, *fleur de lis*, imitation roses, &c., which were found to be actually gilded—that is to say, subjected to an overlaying substance which gave them the color of gold.

All of these articles, it appears, were classified by the defendant (Collector) at the time of importation, under the clause which imposes a duty of 45 per cent. ad valorem upon "manufactures, articles or wares not specially enumerated or provided for in this act, composed wholly or in part of iron, steel, copper, * * * or any other metal, and whether partly or wholly manufactured," while the plaintiffs claimed that the same were dutiable either at the rate of 4 cents per pound, the rate upon "horseshoe nails, hob nails and wire nails, and all other wrought iron and steel nails not specially enumerated or provided for in this act," or at the rate of 35 per cent. ad valorem,

take the necessary steps for the settlement of the same.

American machinery will make a fine display at the approaching Paris Exhibition, perhaps the best ever seen beyond the boundaries of the United States. The American division of Machinery Hall has 40,000 square feet. Chief among the exhibits there will be seen the display of Edison's works and inventions in applying electricity to machinery and lighting. The Thomson-Houston Electric Welding Company will contribute a noteworthy feature to this department by exhibiting a process for welding metals by electricity. The power for the machinery in the American department will be furnished by two steam engines of 100 horse-power each. C. H. Brown & Co., of Fitchburg, Mass., built one, and the other is a new style automatic high-speed engine, constructed by the Straight Line Engine Company, of Syracuse. Agricultural implements will be fully represented and also milling and flour-cleaning machinery. Noteworthy exhibits will be seen, such as Colt's patent firearms and steam engines; a specimen of the work of the Crosby Steam Gauge and Valve Company; a circular loom from J. Van Dussen Reed; an example of the work of the Worthington Pumping Ma-

chine Company. Among the novelties will be found machine tools from William Sellers & Co., of Philadelphia; the Brown & Sharpe Mfg. Company, of Providence, and Warner & Swasey, of Cleveland. In this line will be exhibited a new process for rolling metals into different forms and a machine for rolling and swaging steel screws. J. S. McCoy will show some pneumatic tools for dressing stone and other materials. A new invention is a leather link belt from the American Leather Link Belt Company, through which will be transmitted 100 horsepower. Another peculiar feature for transmitting horse-power is a steel wire belt. George Fred Simmons, of Fitchburg, Mass., will send a machine for rolling metal into forms, and Clough & McConnell a machine for making corkscrews.

Northern Freight Rates.

TWO GREAT IRONMASTERS TALK.

During the past week two of the leading ironmasters of the country, Andrew Carnegie, of Pittsburgh, and Abram S. Hewitt, of New York, have expressed opinions which it would be well for railroad managers to act upon at an early date.

In the course of an address before the Franklin Institute, at Philadelphia, Mr. Carnegie, speaking of Pennsylvania industries, is reported to have said:

If the railroad companies of this State were satisfied with fair tolls its iron manufacturers would still have a show against Southern competition, and Mr Carnegie said he knew that two-thirds of the present rates would leave the railways a good profit in Eastern Pennsylvania. The rates on pig iron were three times greater than in the South. The only hopeful view to take of the situation in Eastern Pennsylvania was that railway rates could and would be reduced on all materials used in the manufacture of iron, which gave the railways so much of their business. The adoption of the basic process of steel-making would also be a helpful factor. It was an ominous circumstance that a big steel company of Harrisburg abandoned its works and occupied others near Baltimore, and it was humiliating to a Pennsylvanian that Baltimore was preferred to Philadelphia as a seaport, where the latter was the natural entry.

It was not easy to fix the responsibility for this removal, and the decadence of Philadelphia as a seaport, he said, but the railways might easily elevate the situation by a reduction of their rates to the rates on products of other States brought through Pennsylvania. It was not by this policy of unjust discrimination that the Pennsylvania Railroad was built up, nor by the maintenance of this policy could it be long maintained.

"I come now to speak of the measures that must be adopted in order to remedy this ill condition, due to coal and railway discrimination. The industries of Pennsylvania are at the mercy of the railroads, and whether her future is prosperous or disastrous is a matter for the railway general freight agent. We are all at his mercy. It is these railroads that most impede the progress of the State that has given them existence than anything else. All portions of the State suffer alike. The Pennsylvania Railroad was once noted for its efforts for the development of the State. Recently such is not the case. If a State commission ever sits—and I hope this will come to pass—it will decide that the charges of the Pennsylvania Railroad Company will be as much less than those of the New York Central and the New York and Lake Erie as reports show them to be greater.

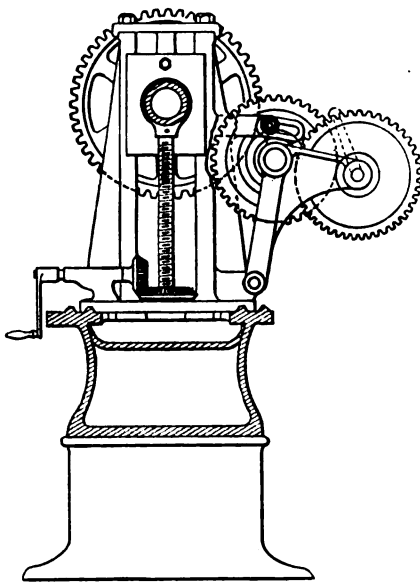
"In 1885, 1886 and 1887 the freight rate per mile of the Pennsylvania in this State was 26 per cent. greater than the New York Central and 22 per cent. greater than the New York and Lake Erie. In the

same years the passenger rates were 20 per cent. more than the New York Central and 15 per cent. more than the New York and Lake Erie's. The profit exacted last year by the Pennsylvania from this State upon freight was 2.20 mills per ton per mile, while in New Jersey it was 1.56 mills—40 per cent. less.

"From their profits in Pennsylvania last year were paid the entire dividend upon the stock—\$1,200,000 handed over to Western lines apparently as a gift and \$1,161,100 expended on repairs and improvements. Here we have this gigantic monopoly levying upon the State whose creature it is a tax beyond a fair return upon its stock of fully \$3,000,000, or, with improvement expenditures, \$4,000,000. Nor is the Pennsylvania alone to blame, for the Delaware, Lackawanna and Western Railroad in 1887 showed a profit per ton per mile charged in Pennsylvania of 1.31 mills, or 31 per cent. more profit per ton per mile than it got in New York State."

Abram S. Hewitt, in an interview at Atlanta credited to him, said:

"It is true that we have been very deeply impressed by all that we have seen



Sectional Elevation Through Head Stock of Machine Shown on First Page.

here in the South, and especially by what we have learned about the sensible and liberal spirit manifested by your railroads toward the industries of the section. It is to this, in my opinion, more than to anything else, that the extraordinary development of your section is due. The wealth is here, but it might have lain here untouched had not the railroads shown so liberal a spirit toward those who undertook its development."

"Are present rates lower than those in the North?" he was asked.

"Very much lower. I should say that the rates upon new materials given by the Southern roads are less than half those given by the roads in the North. You have superior ores and the coal supply at your doors, but your greatest advantage is in your cheap railroad rates, which enable your manufacturers to place their products in any part of the North or West as cheap or cheaper than we can do it.

"The fact that we are dissatisfied with our treatment at the hands of the Northern roads doesn't necessarily mean a change on our part. What we shall insist upon is a change on the part of our railroads, which must give us better rates or we shall be unable to compete with the iron mills of the South."

The Tennessee Coal, Iron and Railway Company have sold to the Anniston Pipe Works, of Anniston, Ala., 11,000 tons of

pig iron, with the stipulated understanding that all of the iron is to be covered by warrants of the American Pig Iron Storage Warrant Company. We understand that the sellers are instructed to deliver the iron into warrant stores, the delivery to begin in April and to cover a period of six to ten months. The sale includes 5000 tons of Gray Forge, 4000 tons of No. 8 foundry and 1000 tons each of open and of close silvery.

The Boiler-Makers' Meeting.

A. T. Douthett, Jr., of the Porter Foundry and Machine Company, Limited, of Allegheny City, Pa., has issued a call for a convention of boiler manufacturers of Pennsylvania, Ohio, New York, West Virginia, Maryland and New Jersey, to be held in the Hotel Anderson, Pittsburgh, on April 16 next. Mr. Douthett informed the representative of *The Iron Age* that the object of this convention is to organize, if possible, an advisory board of boiler manufacturers. In the States named above there are about 450 establishments engaged in boiler-making. An effort will be made to create a greater interest in the manufacture of boilers, make the use of the very best material compulsory, thus decreasing the number of explosions, and to establish a minimum price which will insure a reasonable profit on all boilers built, thus offering a premium for superior style and workmanship. It has been charged that the manufacturers propose to form a trust. We are informed that there is no truth in this report whatever. Each manufacturer entering the association will manage his own trade and sell direct, but it is expected that an agreement will be made that none will sell below the minimum price decided upon. The question of wages will not be considered. Boiler manufacturers, it is claimed, are paying more in proportion to their employees than other workmen in like crafts receive, but members of the new organization will attend to their individual affairs in this respect, and it is contended that the uniform scale of selling will ultimately result in an advance of wages. The sole object of the new association is declared to be to stop the cutting of prices and secure a better grade of boilers. Mr. Douthett is in receipt of a number of letters from different concerns promising their co-operation and stating that they will be present at the meeting. The following manufacturers from Pittsburgh are expected to be present: Porter Foundry and Machine Company, Limited, Ritter & Conley, R. Munroe & Son, Jas. McNeil & Son, Velte & McDonald, S. B. Rheams & Co., Dougherty & Morrison, and W. S. Pendlebury, Son & Co.

John Scott, one of the projectors of the Edgar Thomson Steel Works and until a short time ago a member of the firm of Carnegie, Phipps & Co., died in Pittsburgh on Sunday, aged 68 years. In addition to being president of the Allegheny Valley road he was a director in the People's Savings Bank, a director in the Mansfield Coal and Coke Company, a heavy stockholder in the Pittsburgh Locomotive Works and the Pittsburgh Plate Glass Works, at Creighton Station. He was at one time president of the Pittsburgh, Virginia and Charleston Railroad, and a director in the Pennsylvania Railroad.

The Treasury Department has decided that exported galvanized fencing, manufactured in New Jersey from imported steel and spelter, is entitled to a drawback equal to the duty paid on the imported material, less the legal retention of 10 per cent.

The Hinkle Furnace Plant at Ashland, Wis.

The remarkably heavy output of pig iron achieved by the Hinkle Furnace has attracted much attention. No other charcoal furnace has ever succeeded in making over 85 tons of pig iron in 24 hours, while this furnace has repeatedly exceeded 100 tons, its highest yield thus far having been 111 tons, which was accomplished on the 19th of February. The coke furnaces of the country have improved wonderfully in recent years, totally eclipsing the records of the managers who first became famous for their achievements in furnace driving, and who inaugurated the new departure in

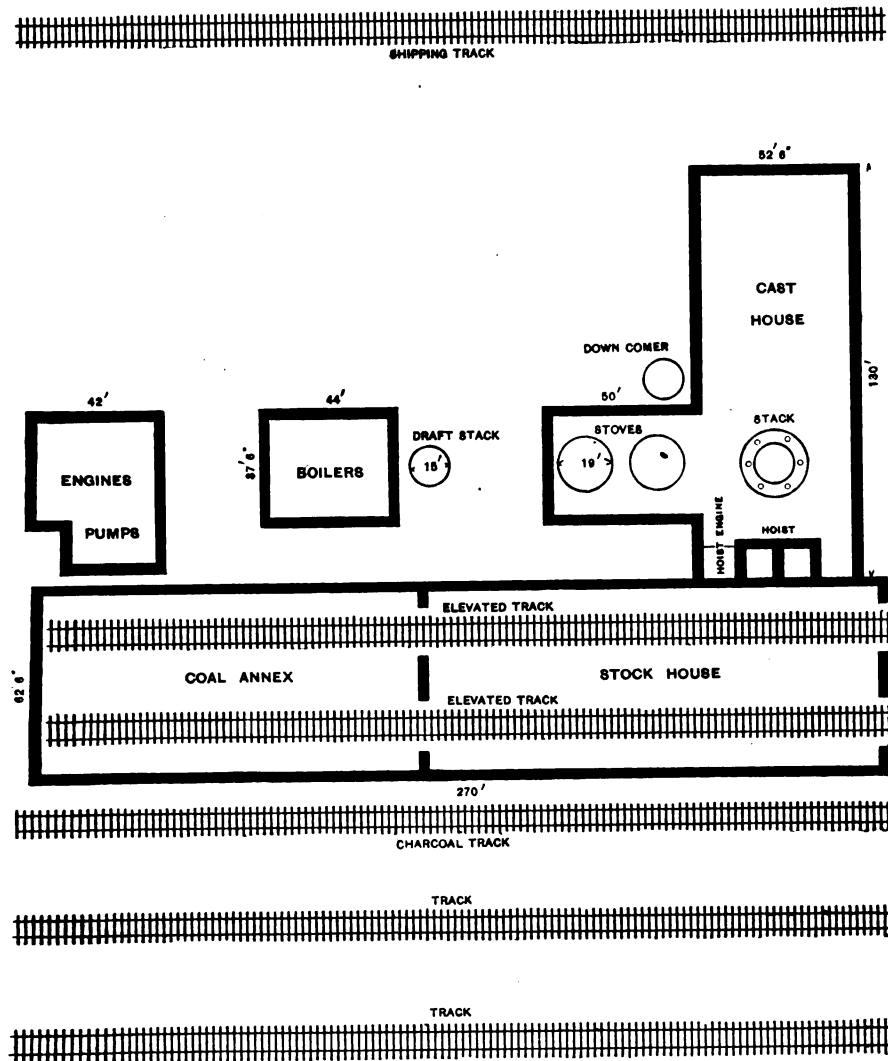
only is this point the natural lake port of shipments for Gogebic ores, but it is also within easy reach of the Vermillion district of Minnesota. Ashland is situated on an estuary of Lake Superior, known as Chequamegon Bay, which is 12 miles long and about 6 miles wide, and forms one of the finest harbors on the lakes. The close proximity of extensive forests of hardwood timber is a natural advantage of paramount value. Thus the three prime requisites for a successful operation of a charcoal furnace, an abundant supply of rich ores, forests of hardwood timber and cheap transportation are found at Ashland. The Ashland Iron and Steel Company were organized and incorporated in November,

long experience in the management of charcoal furnaces running on Lake Superior ores, and he was also made manager. The lines of the furnace were materially changed, other minor alterations were made and the furnace was again blown in August 31, since which time its performance has been in every way satisfactory. A stop of seven days was made from January 18th to the 20th for the purpose of adding some improvements then found desirable. Although it was built to make 80 tons a day, the average for the first blast was but 48½ tons a day. The second blast is much better, averaging 70 tons a day up to January 20, which would have been much increased if the supply of fuel had not run short and if it had not been largely soft-wood coal. Since January 20, up to March 9 (the latest information at hand), the daily average has been 91 tons over. Hardwood charcoal is now being used, but the heavy production of the furnace, it is claimed, is not being accomplished at the expense of fuel. In fact, a slight saving of fuel is being effected as compared with the consumption prior to January 9. Although the cubical capacity of the furnace was somewhat reduced in its reconstruction, it was expected that the output would be increased, but the owners were hardly prepared to find the product running so far in excess of the original estimate made by the builder.

The Hinkle furnace plant is well arranged for handling stock and the finished product. It has direct connections with the Wisconsin Central, Milwaukee, Lake Shore and Western, Northern Pacific and Chicago, St. Paul, Minneapolis and Omaha railroads, with another connection soon to be made with the Duluth, South Shore and Atlantic. In addition, it possesses the advantages of a location on the lakes, affording cheap water transportation for a large part of the year with a vast area of country. The buildings are all of the most substantial character, having Lake Superior red sandstone foundations, brick superstructures and iron truss roofs. The stack is an iron shell, supported on cast-iron columns, with bell and hopper top and a gas-pipe water jacket system for cooling the boshes. The arrangement of the blowing engine and the hot-blast stoves in relation to the furnace stack is most excellent. They stand directly in line, with the stoves between the engine and the stack, so that the air pressure is delivered from the blowing cylinders to the furnace through pipes which are as straight as it is possible to make them. This is illustrated in the accompanying diagram of the works.

The ore is received on two elevated tracks running directly into the stock-house. Each of these tracks covers about 800 feet of linear measurement, and with their approaches, which furnish additional storage room underneath, afford a total capacity for about 30,000 tons of ore. The stock-house is 62 feet by 150 feet and 32 feet high, with an annex in the rear, into which the tracks are continued, which is used for storing charcoal to be held for emergencies, and will contain a very considerable supply. The charcoal for daily use is received on tracks outside of the stock-house, and is unloaded from the cars into the charging buggies within a short distance of the hoist tower. A Blake crusher of the largest size, with an independent engine, is located in the stock-house and is used for crushing limestone and the hard ore from Minnesota. The tower for hoisting stock to the top of the furnace is 85 feet high, built of brick and contains a double cage worked by an Otis hoist engine.

The house in which the blowing engine is located is 36 feet by 42 feet, affording sufficient space for the addition of another engine if that should at any time be



PLAN OF HINKLE FURNACE PLANT.

American coke practice which has so heavily increased the production of pig iron by individual plants. But, while this has been true of coke furnaces, the charcoal furnaces have been lagging, by comparison. The progress they have made has not been brilliant, although it has been steady. The opportunity for distinction in this respect seems to have been left for the Hinkle Furnace, and the manner in which it has distanced its competitors shows the possibilities of large charcoal-iron output which have always existed, and the probability of still greater achievements to be realized through the sleepless rivalry of ambitious managers. The following information about this new furnace will be of interest to our readers.

The discovery of large deposits of rich iron ore and the development of numerous mines in the Gogebic range of Northern Wisconsin and Michigan suggested the location of this furnace at Ashland. Not

1886, aided and encouraged by the generosity of enterprising citizens. A site was chosen for the furnace in the west end of the city of Ashland, the property of the company comprising a total of 14 blocks with an extensive frontage on Chequamegon Bay.

A contract for the erection of an 80-ton charcoal furnace was made with James P. Witherow, of Pittsburgh, in the spring of 1887. The work of construction was performed under the direct supervision of his constructing engineer, E. C. Darley. The blowing engine, however, was built by Edward P. Allis & Co., of Milwaukee. The furnace was completed and blown in April 4, 1888, under the management of C. P. Perrin. The furnace not operating satisfactorily, the owners decided to blow it out and remodel it in some respects, so that this blast ended on June 30. The work of reconstruction was placed in the hands of Morris R. Hunt, who had had

deemed desirable. This engine is of the vertical type, with a heavy cast frame, was built by Edward P. Allis & Co., of Milwaukee, and is described in a separate article. It is now run at a speed of about 26 revolutions per minute and delivers a pressure in the furnace of about 5 pounds. Adjoining the engine-house is the pump-house, 18 feet by 34 feet, containing three Dean duplex pumps and one No. 10 Cameron pump. Water is obtained from a natural reservoir in the immediate vicinity, but a supplemental pump works has also been provided to supply water to the furnace directly from the lake in case of accident to the regular supply. The roof of the engine-house is composed of a water tank which holds 76,000 gallons. The boiler-house is 42 feet by 38 feet and contains three Heine safety boilers, each of 150 horse-power, with space left for additions. The furnace supplies all the gas needed for fuel to operate these boilers. The draft stack is built with an iron shell with fire-brick lining and is 150 feet high and 7 feet in diameter. The stove-house, 55 feet by 65 feet, contains two Whitwell fire-brick stoves, as improved by Witherow, each 18 feet by 60 feet. These stoves, as now run, average about 900 degrees.

The furnace stack has been incorrectly reported to be 65 feet high and 12½ feet in diameter of bosh. It is only 60 feet high and 12 feet in diameter. But it is too large for the cast house, which will soon be extended to accommodate the enormous product. Its dimensions at present are 52½ feet by 132 feet. Four casts are made daily, and each cast covers considerably more than half the floor of the house, keeping the workmen very busy in getting out the iron and making up the pig beds afresh. It may be remarked incidentally that the large production of this furnace is principally confined to Nos. 1 and 2, showing most excellent results as to quality. Each pig is broken in the cast house and carefully graded before it is taken out, which is done by a grader who makes this his especial business. The iron is piled in the yard adjoining the cast house and in carload lots, according to the usual practice in the Lake Superior region. A railroad track passes along conveniently for shipping the iron from this yard, which is sufficiently large to store 10,000 tons. A dock immediately in the rear of the cast house enables iron to be loaded directly into the cars from the pig beds. A feature sufficiently unusual about charcoal blast furnaces to make it worthy of remark is the comfortable office building which has been provided for the manager and clerical force. It is a two-story brick building, with a vestibuled entrance and double-sashed windows, which are needed for comfort in the winters of this Northern location. The manager's room is very tastefully fitted up and furnished.

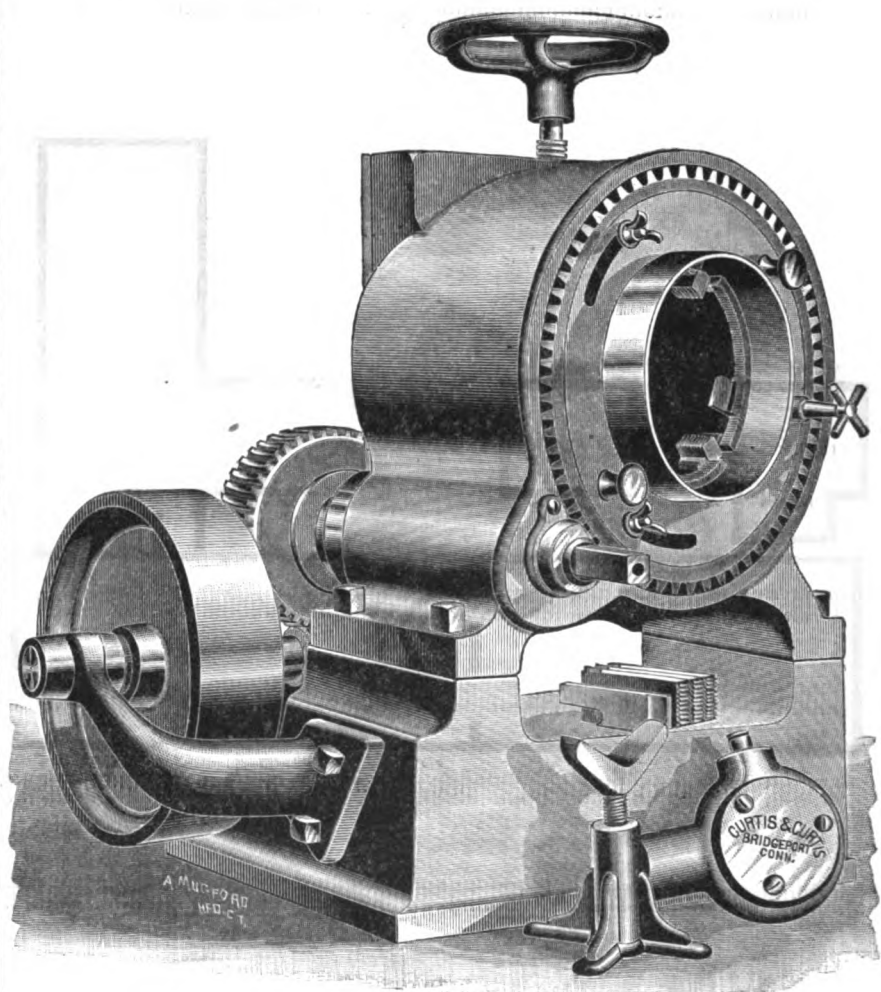
The Ashland Iron and Steel Company own timber property within easy reach of the furnace by rail, comprising about 10,000 acres of heavily-wooded land. The timber is mainly hardwood, such as maple and birch, and its extent insures an ample supply of fuel for the furnace for many years. The company have built 77 kilns, each with a capacity of 55 cords, along the line of the Wisconsin Central and Milwaukee, Lake Shore and Western railroads, within a short distance of Ashland. The kilns are built of brick on what is known as the Hottentot plan, which was introduced into the Lake Superior region by H. S. Pickands, and has proved a very satisfactory system for making charcoal. The cars used for transporting charcoal from the kilns to the furnace are 35 in number, and were specially constructed for the purpose. While the furnace company have thus arranged to control their fuel supply, they have made no investment in iron ore mines, believing that their proximity to the numerous mines of the Gog-

bic and Vermilion regions producing high-grade low phosphorus ores insures them an ample supply of the best quality at reasonable prices. The ores used now are almost entirely from the Gogebic, the admixture of Vermilion ore being but slight. The average yield is now 57 per cent. in the furnace. The limestone used is brought from Depere and Fond du Lac, Wis., and is said to be a fine flux, but its value in this respect is not being very severely tested, as only 150 pounds of it are used to the ton of pig iron.

The officers of the Ashland Iron and Steel Company are as follows: A. H. Hinkle, president, Cincinnati; W. H. Hinkle, secretary and treasurer, Minneapolis; Morris R. Hunt, manager, Ashland. The founder is Thomas Mackey. The

Pipe Cutting and Threading Machine.

This machine is made by Curtis & Curtis, of Bridgeport, Conn., in four sizes, as follows: 2½ to 4 inches, 4 to 6, 3½ to 6 and 2½ to 5 inches, inclusive. It consists of either of the larger sizes of their hand machines placed on a power base. At the back is a worm wheel which engages with a worm on the driving shaft, and through it is transmitted the power from the pulley to the pinion. The machine is operated by placing the pipe to be cut through the vise at the back, with its end against the back of the dies, and then tightening the hand wheel at the top of the machine, which brings the pipe central with the dies and also clamps the vise. The large gear is furnished with a lead screw cut on



PIPE CUTTING AND THREADING MACHINE, MADE BY CURTIS & CURTIS.

sales agents are Pickands, Brown & Co., Chicago; Pickands, Mather & Co., Cleveland; Rogers, Brown & Co., Cincinnati; Rogers, Meacham & Shields, St. Louis. The brand under which the iron is known is "Hinkle."

The Antrim Iron Company, whose furnaces are at Mancelona, Mich., announce through their secretary and treasurer, J. C. Holt, at Grand Rapids, that they have undertaken the sale of their own Lake Superior charcoal iron from the Grand Rapids office. The furnace is running successfully, making about 60 tons of iron per day.

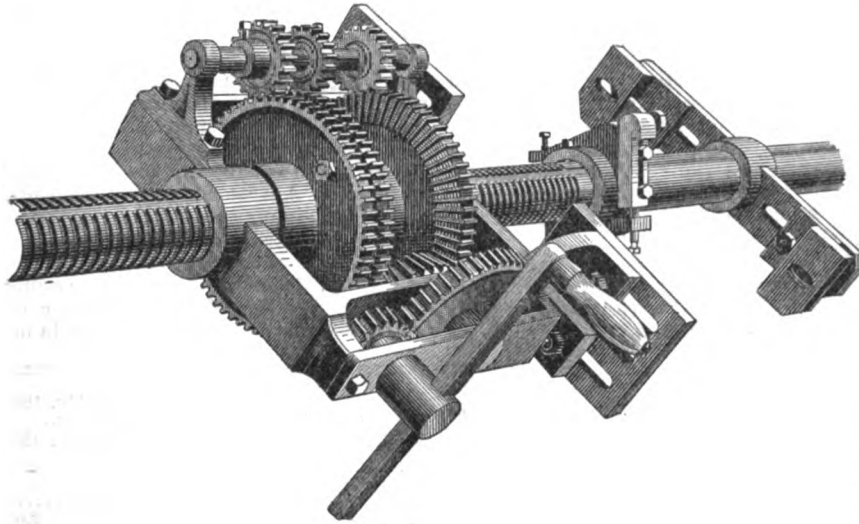
High ocean freights continue to restrict the business in foreign iron ores. We understand that from Mediterranean ports freights are 14/ to 15/, according to port, although they have been higher. Only a few cargoes have been sold thus far.

its back of the same number of threads to the inch as the pipe to be cut, and as the gear revolves it is drawn back into the shell and the dies on to the pipe. The dies can be changed by simply loosening the thumb-nuts a few turns and drawing the face plate forward about ¼ inch, when the dies will drop out. The dies are adjusted to the size of pipe to be cut by turning the face plate to the graduation corresponding to the size of pipe. By deviating a little from the standard graduation the pipe can be cut either over or under size to allow for any variation of the fittings. In cutting off pipe the gear is run as far back in the shell as it will go in order to free the lead screw and allow the gear to have simply a rotary motion in the shell. The cut-off tool is forced into the pipe as it revolves by a wedge screwed down behind it. An important feature of these machines is that, if at any time a single die of a set becomes broken or lost, it can be replaced at a small cost without

buying an entire set. This machine is particularly adapted for those who, while they have power in their shops, still want a machine that can be taken out on a job to be worked by hand; it can be easily taken from the base and used as a hand machine. When arranged as a hand machine, it is said that a boy can thread a 6-inch pipe in 10 minutes without assistance and without fatigue.

Cylinder Boring Machine.

It is claimed that this machine will bore 12 inches per hour in cylinders 18 or 20 inches in diameter, and in small cylinders,



CYLINDER BORING MACHINE.

from 6 to 12 inches in diameter, it will bore from 15 to 20 inches per hour, as it can feed faster on small work. On the feed-screw turns an internally-threaded hub rotated by either one of two wheels of unequal diameters. Adapted to engage with these two gears are two unequal pinions mounted upon a sleeve revolving with and sliding upon a second shaft, which is driven by a pinion engaging with a spur-and-bevel wheel loose upon a sleeve on the main shaft. The beveled portion of this wheel meshes with a pinion on a shaft having at its outer end a gear meshing with a pinion on a crank shaft. Either one of the two pinions may be brought into gear with its spur gear. Through this train of gears the feed-screw is turned. The two cutter heads are placed directly opposite each other, thereby insuring accuracy, and each cutter may be set in or out by a set-screw, and so arranged as to bore both ways. The machine is so compact it is unnecessary to detach the cylinders. The sole agent for this machine is J. R. S. Nichols, St. Louis, Mo.

An incident of some importance to the Chicago iron trade is the concentration of interests in a particular locality which is now in progress. Pig iron commission houses, manufacturers' agencies for the sale of bar iron and steel, and city offices of local iron and steel works have hitherto been scattered over a considerable part of the city. Some office buildings contained a fair sprinkling of the trade, but quite generally the representatives of iron and steel interests were isolated from one another. The movement now in progress bids fair to pretty thoroughly concentrate the trade by the 1st of May in the two large office buildings known as the Rookery and the Phenix buildings, which are within a block of each other, the Grand

Pacific Hotel lying between them. The Rookery is by far the larger of the two buildings, ranking among the largest office buildings in the world. It is 11 stories high. The whole of its tenth story has been secured by the North Chicago Rolling Mill Company, the Joliet Steel Company and the Union Steel Company. Scattered through the other stories of this large building are pig iron commission houses, manufacturers' agencies for all kinds of iron and steel works, agents for railway supply manufacturers, offices of local iron and steel works, offices of railway associations for the regulation of traffic, a bureau of inspection of railway material, financial corporations,

and a host of representatives of other interests attracted to the building by the character of its principal tenants. The Phenix Building has an excellent showing of iron and steel houses, railway supply agencies, &c. The location of these buildings is admirable in many respects, the post-office being on the next block, several passenger depots lying

tion of the company to establish their works in the natural gas district, and locations are now being investigated in Indiana with a view to the adoption of a site wherever the greatest advantage can be secured, taking into consideration the supply of gas, railroad facilities, &c. The company will manufacture sheet iron and tin plate, their purpose being to make a specialty of the latter. They claim to have looked into the question of cost very closely, and to have satisfied themselves that with free fuel and proper management it is possible to make tin plate at a profit under existing conditions. If the duty on tin plate is advanced, as was proposed in the Senate tariff bill, their chances of success will of course be improved, but they are not depending on that contingency. The iron-making plant at Pittsburgh now owned by Mr. Hammond is to be removed to the location selected and will form part of the company's works. Encouragement is stated to have been received from quite a number of dealers in and consumers of tin plate at Chicago, who would welcome the domestic product if it should be of good quality and would compete with imported tin plate in prices.

Journal Box.

The patented journal box which is here illustrated was designed by Pedrick & Ayer, of Philadelphia, for use on their universal milling machines. To apply the box it is best to bore a straight true hole through the housing and turn the outer shell to fit, and cut a ratchet tooth thread inside, as shown in the longitudinal section, Fig. 1. The bronze bearing proper is threaded to fit the outer casing. Both the outer casing and the bearing are split as shown in the cross sectional view, Fig. 2, one cut going entirely through and the other two nearly through. It will be readily seen that by screwing them both together in the housing each will be screwed up to a perfect bearing, at once making a very essential feature, an end fit. By continuing the process, as the threads attempt to slip or pass over each other, the inclined surface of the threads acts at all points as a wedge and closes the inner shell to a perfect fit on the journal,

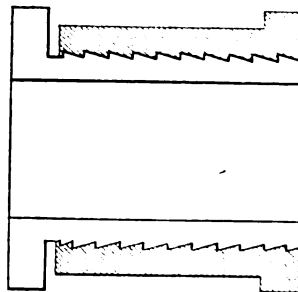


Fig. 1.

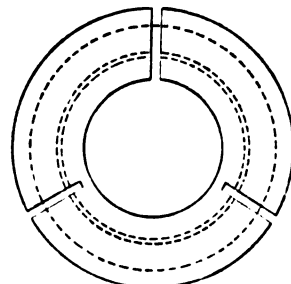


Fig. 2.

within easy walking distance, and the street-car lines of the different divisions of the city running close to them.

The Rogers Siberian Iron and Tin Plate Company, of Chicago, incorporated under the laws of Illinois, with a capital of \$200,000, has been organized by the election of the following officers: Samuel W. Adams, formerly superintendent of Crane Bros. Mfg. Company, president; William Rogers, formerly of Rogers & Burchfield, Leechburg, Pa., general manager; Wm. J. Hammond, a Pittsburgh iron manufacturer, vice-president; Francis W. Holbrook, formerly Chicago manager for A. T. Stewart & Co., treasurer. It is the inten-

while at the same time the outer one fills the place prepared for it in the housing, making a solid bearing for all parts. An essential feature is that the bearing never changes end ways, and all trouble and wear arising from this cause are overcome.

United States Consul Griffin, at Sydney, who has just returned from Australia, says the colonists in New South Wales manifest much cordiality toward Americans and desire to form closer trade relations with this country. They are more American than English in business matters, and in fact have adopted as nearly as possibly American systems of conducting their public institutions.

The Progress of Electricity.

The meeting of the National Electric Light Association at Chicago was opened by an address by its president, S. A. Duncan, in which the progress made in the introduction of electricity as a business was reviewed as follows:

But few of the gentlemen of this country who are commercially connected with the manufacture and distribution of electric light and power and the apparatus used therefor are aware that five years ago this month a handful of men met in this city and organized a movement which has grown into the large and powerful organization of which we are members and which is in session at the present time.

The industry of electric lighting at that time was carried on with all the enthusiasm which comes with a new undertaking, and with the mistakes which are sure to arise in the commercial introduction of any great industrial agency. The gentlemen engaged therein, strangers to one another, working independently with no attempt at harmony, with but little knowledge of one another's methods of business, with no established custom or precedent to guide them, came together for the purpose of deriving those benefits which invariably result from the deliberate discussion of those mooted questions which are common to the experience of all electric-light men. It may be remembered that in the early days of this association the chief question before the electrical fraternity was the then all-important question of arc lighting. The incandescent light had scarcely come into commercial use. No sooner had the questions involved in arc lighting been solved by the natural pressure of public demand than the complicated questions involved in the distribution of incandescent lighting absorbed the attention of the fraternity and occupied the meetings of this association. Following closely upon the problem involved in incandescent lighting came the question of electrical distribution of power; first for stationary motor purposes and afterward for the purpose of electrical locomotion. This question is to-day perhaps the most important one before the electrical fraternity. To say that electrical power is not to-day a success would be to reflect upon the scores of electrical railways now in successful operation in this country, and upon the thousands of electric motors that are every day commercially serving the wants of man.

We may here profitably consider some figures indicating the growth of the electric lighting and power industry, the increase in the number of central stations, arc and incandescent lamps, electric motors and electric railways now in operation. At the meeting of this association one year ago it was estimated that there were not less than 4000 central stations and isolated plants in operation in the United States. From the accompanying statistical table, it may be seen that the number of central stations and isolated plants at the August meeting of 1888 was 5351, and at the present time is 5747. This shows an increase during the first six months of the year of 1351 central station and isolated plants and an increase during the latter half of the year of 716, making a total increase during the year of 2067 plants. Figuring in percentages, the increase during the first half of the year was 32.3 per cent. in the total number of central station and isolated plants, and during the latter half of the year it was 13.5 per cent., making a total increase for the year of 45.8 per cent. It was estimated a year ago that there were 175,000 arc lamps in daily use in the United States. Six months ago I found upon investigation that there were 192,500. At the present time I find that there are 219,924, making an increase during the first half of the year of 62,625 arc lamps, and during the latter

half of the year an increase of 27,424, making a total increase of arc lamps in use during the whole of the year 32,525. Figured in percentages, the increase the first half of the year shows 20.1 per cent. the second half 14.2 per cent., making a total gain of arc lamps for the year of 34.3 per cent. A year ago it was estimated that there were 1,760,000 incandescent lamps in daily use in the United States. Six months ago I found that there were 2,142,440. At the present time there are no less than 2,504,490, making a gain during the first half of the year of 392,924, and during the latter half of the year of 361,546, or a total gain for the year of 754,990 incandescent lamps. Figured in per cent., it shows a gain during the first half of the present year of 32.3 per cent., during the latter half 16.7, a gain during the whole year of 49 per cent. It is also interesting to notice what the increase in capitalization has been in the electric-light companies in the United States during the year. During the first half of the year the increase was \$42,210,100; during the latter half it was \$27,187,634, making a total gain during the year of \$69,397,734.

It is also interesting to note some comparative figures upon the electric-railway industry. Six months ago there were 84 electric railroads in operation in the United

The F. C. Austin Mfg. Company.

The new factory of the F. C. Austin Mfg. Company, of Chicago, is now in full operation, turning out a great variety of earth-handling machinery. The factory is a brick structure, two stories in part, covering a tract of ground about 200 feet square at the corner of Carpenter street and Carroll avenue. A large and well-equipped blacksmith shop forms an important department of the works. It is supplied with a steam hammer, drop-forge and shaping machines. A machine shop and wood-working shop are fitted up with the most approved tools for working in iron and wood. The company have their own dynamo for electric lighting, so that they are enabled to run both day and night in getting out orders for quick delivery. Part of the building is used as a warehouse, in which machines are so placed that those to be operated by steam-power can be connected with overhead shafting and shown in motion for the satisfaction of buyers. A large elevator in the center of the building is used for the purpose of loading machinery on wagons from the warehouse floor or to convey it to the second story. The company have secured control of the New Era grader and excavator, which is a standard machine in use

	February, 1888.	August, 1888.	February, 1889.	Feb'y, 1888, to Feb'y, 1889.
Central station and isolated plants.....	4,000	5,351	5,747	.....
New central stations and isolated plants.....		1,351	716	2,067
Per cent. increase of central stations and isolated plants.....	175,000	32.3	13.5	50.1
Arc lamps.....		192,500	219,924	.....
Increase of arc lamps.....		35,201	27,424	62,625
Per cent. increase of arc lamps.....	1,750,000	20.1	14.2	34.3
Incandescence lamps.....		2,142,440	2,504,490	.....
Increase of incandescence lamps.....		392,944	361,546	754,490
Per cent. increase of incandescence lamps.....		32.3	16.7	49
Increase in capitalization of electric light companies.....		\$42,210,100	\$27,187,634	\$69,397,744
Total.....		84 Inc.	19	53
Electric street railways in operation.....		83 Dec.	89	44
Electric street railways being built.....				
Electric street railways incorporated but not yet contracted for.....		39 Inc.	3	42
Electric cars in operation.....		223 Inc.	155	378
Electric cars under contract; roads not yet finished.....		244 Inc.	185	329
Miles of single track in operation.....		138 Inc.	157.5	294.5
Miles of single track under contract, not yet in operation.....		189.5 Inc.	84.25	273.75

States. During the last six months there has been an increase of 19, making at the present time a total of 53. Six months ago there were 83 roads in process of construction. There are 39 less at the present time, making the number of roads now under construction, not finished, 44. Six months ago there were 39 electric roads incorporated in the United States upon which construction had not yet begun; at the present time there are 42. Six months ago there were 223 electric cars in operation. Since that time 155 have been put into commission, making at the present time 379 cars in operation. Six months ago there were 144 cars under contract but not in operation. This number has increased by 185 during the last six months, making a total of 329 electric cars at present under contract but not running. Six months ago there were 138 miles of single track in operation; during the past six months there has been an increase of 157½ miles, making a total at the present time of 294½ miles of single track in operation. Six months ago there were 189½ miles of single track under contract but not in operation. At the present time there are 273¾ miles of single track under contract but not in operation. It would be profitless for me to draw elaborate deductions from these figures. They tell for themselves the story of prosperity and rapid growth throughout every department of the electric light and power industry.

by railroad contractors, public road commissioners, irrigating ditch contractors, &c. It is drawn by 12 horses, and delivers the excavated earth by means of a wide belt passing crosswise over it to a bank above the level of the grader or to a wagon or cart alongside. Road scrapers are made for leveling ordinary roads which are in demand all over the country. Appliances for boring wells are also made, and in connection with this line it is proposed to manufacture windmills and a special pump. Among other products of the company are mills for grinding feed, steam farm cookers, &c. The offices are located in connection with the warehouse. While this establishment may be regarded as an outgrowth of the well-known firm of Goulds & Austin, it is an entirely independent organization, none of the members of the company being now connected with the old firm, whose business is being conducted under the name of the Goulds, Austin & Caldwell Company, making a specialty of pumps, pump supplies, pipe, &c.

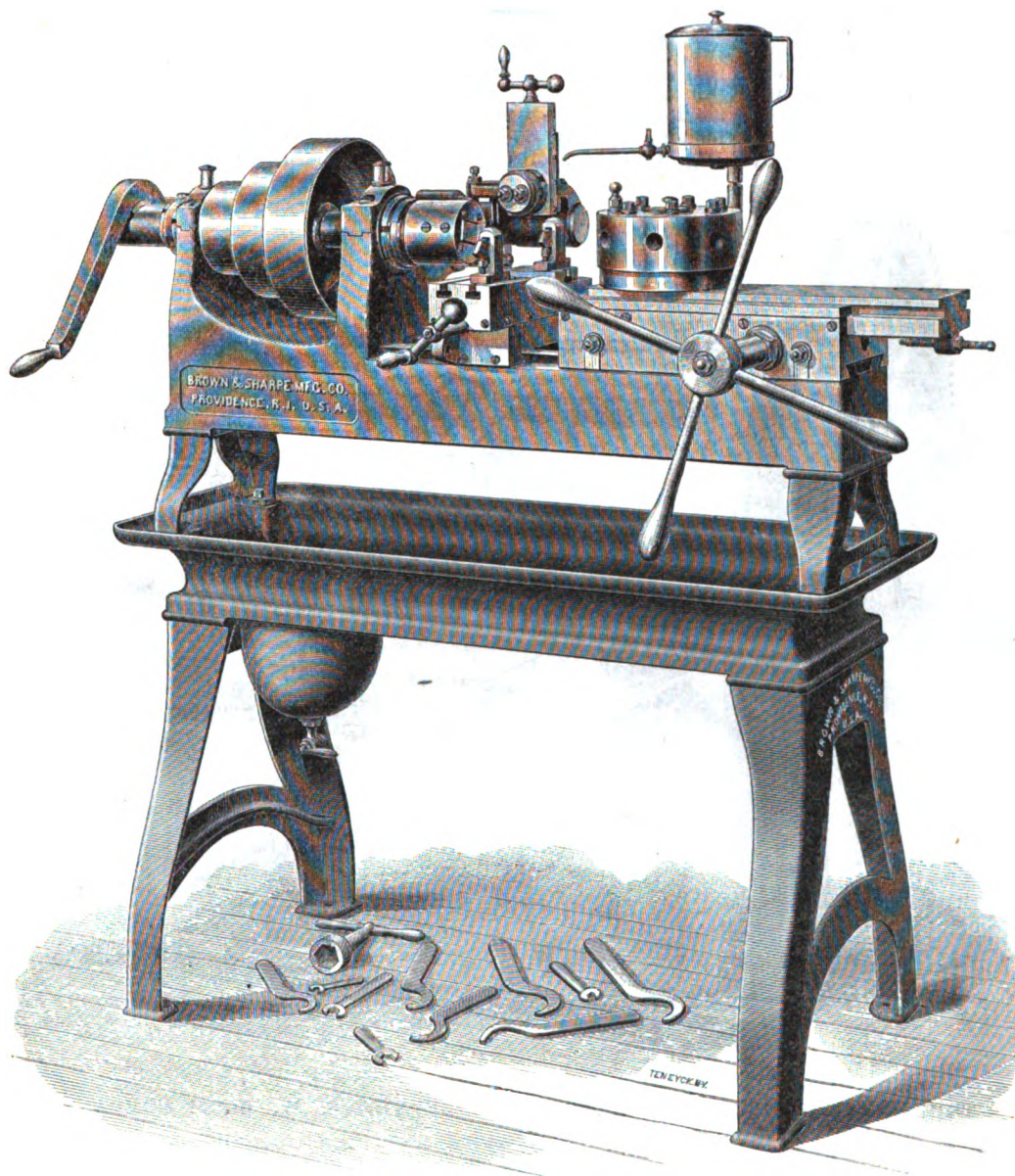
We are informed that the American Pig Iron Storage Warrant Company now have signed contracts with furnaces representing an annual output of 813,500 tons, and agreements to sign, subject to confirmation of boards of directors, from furnaces representing an annual product of 629,000 tons.

Screw Machine.

We herewith illustrate the No. 5 screw machine made by the Brown & Sharpe Mfg. Company, Providence, R.I. Although their machines are designed primarily for making screws, they are, whenever screws are not required in sufficient quantities to render entirely automatic machines preferable, also used in making a large variety of pieces from iron or steel bars, and in finishing castings or forgings that may be held in a chuck while being subjected to one or more operations. This fact is illustrated in the works of the manufacturers

simple and durable device. The spindle-boxes are $2\frac{1}{4}$ inches and $2\frac{1}{2}$ inches in diameter and $2\frac{1}{4}$ inches and $2\frac{1}{2}$ inches long, and are of steel, hardened and ground inside and out. The spindle is also of steel, and its front bearing is hardened and both bearings are ground. The cone has three diameters, 6, $8\frac{1}{2}$ and 11 inches, for 3-inch belt. The size of the holes through the spindle is $1\frac{1}{2}$ inch; the number of holes in the revolving heads is seven, and the diameter of these holes is $1\frac{1}{4}$ inch; the movement of the revolving head-slide is $9\frac{1}{2}$ inches, and the length that can be milled is 6 inches. The swing over the slide-rest is

Company, of Dighton, Lane County; capital, \$100,000; directors, C. T. Prouty, J. C. Wilkinson, P. J. Murphy, W. M. Woods, D. R. Bennett, J. F. Andrews, J. R. Greenlees, F. P. Stearns, and V. H. Grinstead, all of Dighton. The American Sugar Company, of Meade Center, Meade County; capital, \$500,000; directors, N. J. Adamson, M. J. O'Meara, William K. Palmer, O. B. Hamilton and George M. Cockrell. The Spiney Sugar Company, chief offices at Spiney and Kingman; capital, \$125,000; directors, J. J. Strickland, E. B. Poole, J. G. Conkling, Joseph Strickland and N. P. Strickland,



NO. 5 SCREW MACHINE, MADE BY BROWN & SHARPE MFG. COMPANY.

of this machine, where only one out of every eight screw machines is usually employed in making screws; the eight are generally employed in finishing studs, nuts, washers, pins, &c., from round, square and hexagonal bars, while one-half the machines are engaged on small wheels, cams or the small parts of machine tools. So many of the last-mentioned tools have come to be made on the screw machine in the Brown & Sharpe shops as to call for special drawings marked "small parts made on screw machine." In this machine ten tools can be used without removing the work from the chuck. A lever, to be used in operating the cutting-off slide in place of the screw shown in the cut, is furnished when desired. The turret-head is secured in position by a

$6\frac{1}{2}$ inches, and over the bed $13\frac{1}{2}$ inches, while the length of the bed is 50 inches. The floor space occupied by the machine measures 32 x 62 inches.

A press dispatch from Topeka, Kan., states that the new law enacted by the State Legislature which has just adjourned, enabling counties, townships and cities to vote bonds not to exceed \$20,000 for the purpose of encouraging the building of sugar factories, is already being taken advantage of, and the Governor expresses the opinion that 50 factories will be established under the law before the close of the season. Three charters were filed with the Secretary of State on the 20th inst. for sugar companies, as follows: The Dighton Sugar

all of Kingman. An opening is thus being established for the consumption of considerable quantities of machinery, which will be furnished by those in a position to take advantage of this new demand.

The continued decline of the foreign trade of Philadelphia is shown by the report of Collector Cadwalader, just completed. While the value of imports in 1888 amounted to \$45,020,000, an increase of \$5,449,000 over the previous year, the exports dropped to \$28,013,000, a decline of \$5,800,000, the lowest since 1872. Local papers attribute this difference wholly to discrimination against Philadelphia by the railroads. More than one-third of the entire value of imports comprised sugar brought to that port to be refined.

Trimming and Squaring Shear.

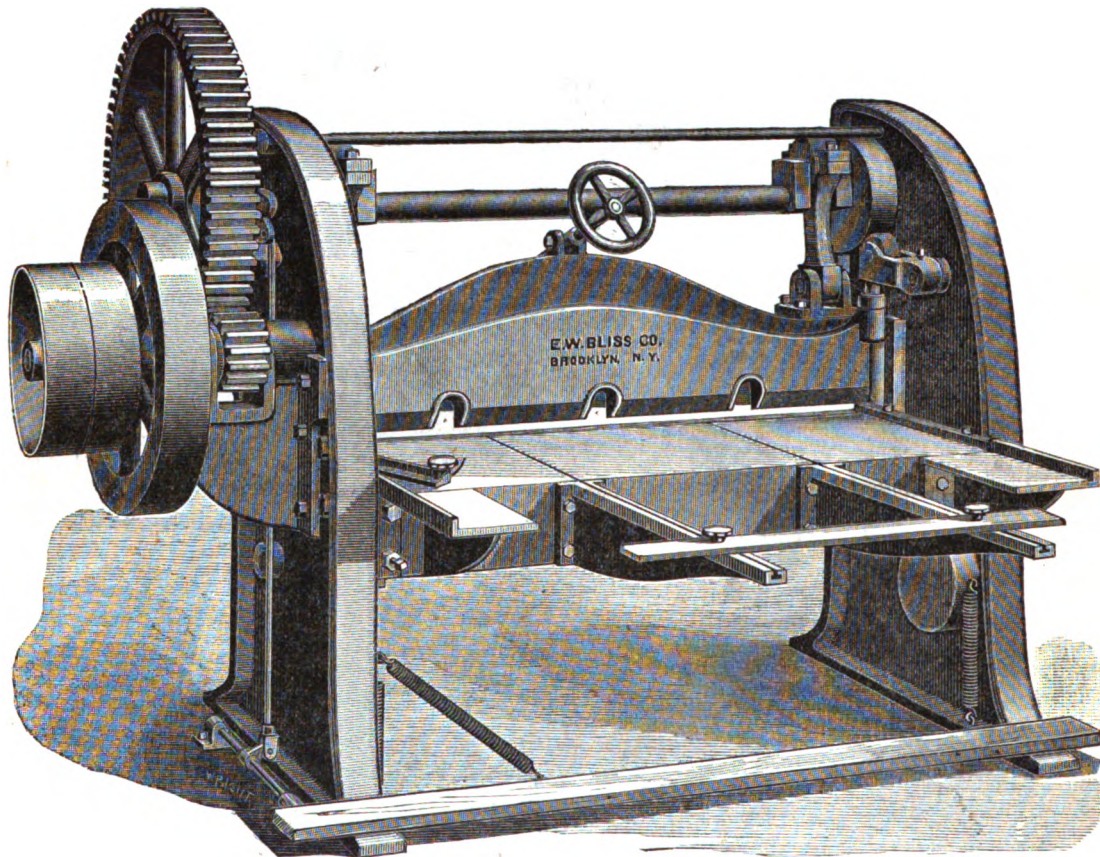
The illustration here presented is that of a trimming and squaring shear especially intended for the use of manufacturers of sheet-metal work for building purposes. It will accurately cut sheets from 30 to 14 gauge in thickness and up to 10 feet in length at one stroke. It is claimed by the manufacturers, the E. W. Bliss Company, of Brooklyn, N. Y., to be a step in advance of any machine heretofore built for a similar purpose. In general design this shear somewhat resembles another and heavier machine built by the same company for rolling mill work; but in some of the details of construction it is radically different. The cutter-bar is operated by a shaft with two cranks in the usual way, and there is an adjustable clamping bar worked automatically by cams on the crankshaft and sliding in guide-ways

removed when the whole width between housings is required for making rectangular cuts. Both sets of gauge slots are marked with convenient graduations. Mounted on long arms on the back of the machine is an adjustable gauge so connected by long screws and miter gears that it may be quickly placed at any desired distance from the cutters by turning the hand-wheel shown at the top of the cutter-bar. Both ends are moved equally, and accurate adjustment is thus quickly accomplished without the necessity of the operator leaving his position in front of the machine.

Molding in the Third Story.

A decidedly novel arrangement of a molding-room has been made in the foundry recently built by the L. Wolff Mfg. Company, of Chicago, at Hayne

from the cupola to the flasks. Chain hoisting blocks hold the ladles at any desired elevation. The cupola is situated midway on one of the sides of the molding-room, and it has a heavy iron floor back of it for holding charges, which are brought up from the ground floor by a steam elevator. The soil-pipe cores are made on the molding floor, six machines being used for the purpose, operated by power. They are put into the flasks green. A power press is used to press sand into small molds for fittings, thus saving considerable labor, one press answering for four molders, two benches being on each side of the press. The engine is on the ground floor, and power is transmitted by belts. It is of 125 horse-power, and is of the Reynolds-Corliss pattern, built by E. P. Allis & Co., of Milwaukee. The second story of the building is used for a machine shop, pattern shop and storage.



TRIMMING AND SQUARING SHEAR, MADE BY THE E. W. BLISS COMPANY.

immediately in front of the cutter-bar for firmly clamping the sheets while being cut. Counterweights under each end of the table raise this bar after the cut is made and it has been released by the cams. There are three or four openings provided in this bar to enable the operator to clearly see the cutting lines on the sheets. Upon a heavy bracket attached to the left side of the machine a shaft is placed for carrying the fly-wheel, which is 34 inches in diameter and weighs 400 pounds; also the 20 x 5 inch tight and loose pulleys and pinion. This pinion drives the spur-gear on the main crankshaft, which is 36 inches diameter, the proportion between them being six to one. A new and very powerful clutching device is used to lock the spur-gear to the crankshaft, the construction of which is simple, yet effective. A slight rocking or side movement of the treadle serves to trip the clutch and set the cutter-bar in motion.

In addition to the usual side and front gauges, one arranged especially for cutting any angle up to 90° is provided on left side of the table, which may be quickly

street and Carroll avenue. The building is a very substantial brick structure three stories high, and the molding-room is in the top story. Ample ventilation and an abundant supply of light are thus secured, which would not be the case if the ground floor was used for this purpose, with the other departments of the works in the upper stories. Wherever economy of space is desired and castings are not excessively heavy, this arrangement seems to be most excellent. The L. Wolff Mfg. Company make plumbing supplies, and use their foundry for casting soil-pipe, sinks, bathtubs, pipe fittings, &c. The floor of the molding-room consists of heavy planking, on which cedar blocks 4 inches high have been set on end as in street paving, over which a good coating of loam has been spread, forming a thorough protection against fire from the splashing of hot metal. The roof of the foundry is constructed with a wide deck running down the center having windows along both sides of it. The deck is supported on heavy trusses resting on pillars. The trusses are also used to hold overhead railways to carry ladles of metal

The ground floor is devoted to offices, storage-room for pig iron, coke, soil-pipes, sand, &c., engine-room, galvanizing-room, for galvanizing kitchen boilers; enameling room, for enameling the insides of cast-iron sinks, bathtubs, &c.; and tarring-room, for tarring pipes and fittings. The entire building seems to be most admirably adapted to the business which the firm carry on in it.

The Portsmouth *Blade* makes a strong plea for the building of an extension of about 13 miles of the Ohio and Northwestern Railroad from Portsmouth up Pine Creek and beyond Waterloo into the coal and iron region of that section, for which it claims exceptional advantages.

The city of Ogden, 13 miles from Salt Lake City, has 13,000 inhabitants. A correspondent at that point says: "Ogden has iron, coal and limestone within a few miles of the city, and her chief ambition has been to make iron and iron products, especially merchant bar and stoves."

Tension Carriage With Staggered Arm Sheave.

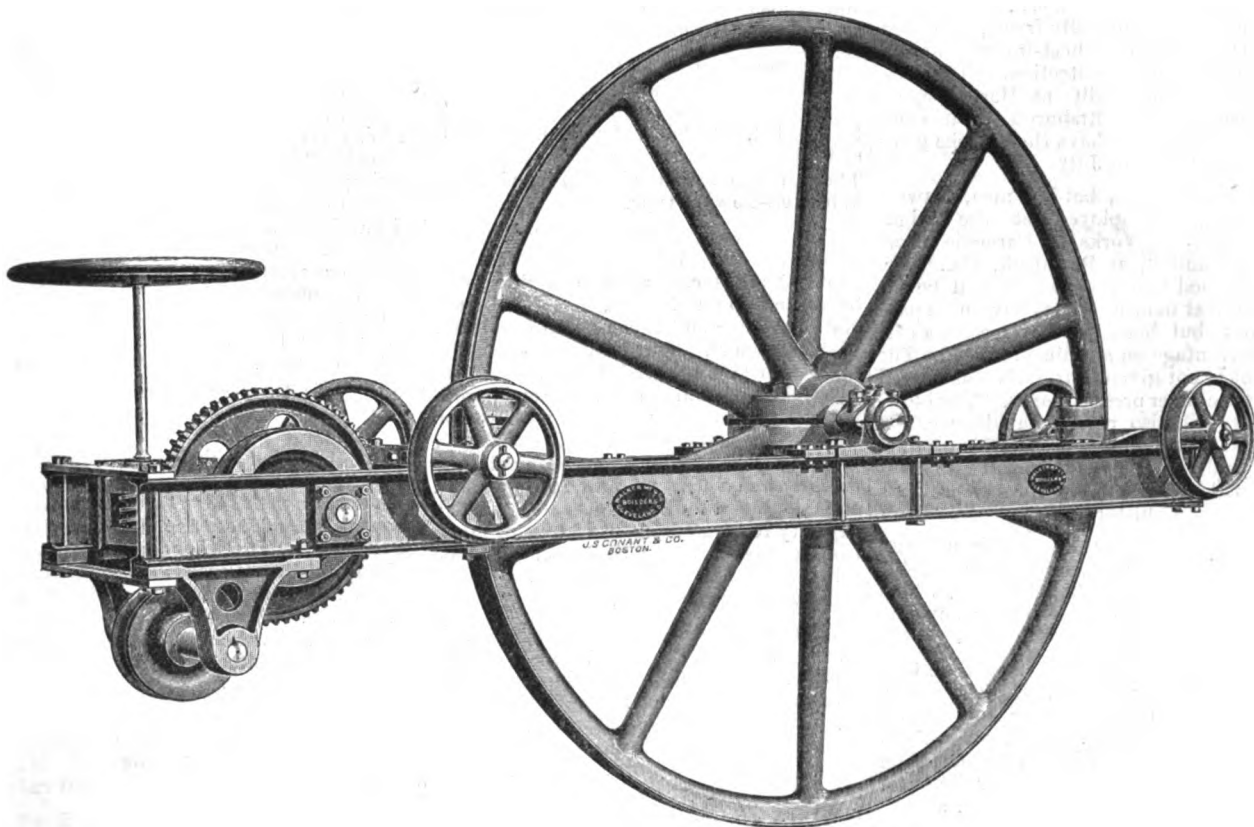
The framework of the tension carriage illustrated consists of side iron beams, secured to the upper side of which are the axles on which the truck wheels revolve. These wheels are chilled on their outer faces and are supplied with a series of anti-friction rollers to facilitate their sensitive action. The large wheel over which the cable passes is made with staggered arms, which add to its rigidity. The chain connecting with the tension weights engages in a sprocket-wheel, and an idler is placed below the chain, which is kept in contact with one-half the circumference of the wheel. The worm shaft on which the operating hand-wheel is located, being carried in a slide, is readily engaged and disengaged. This tension carriage, which is made by the Walker Mfg. Company, of

very narrow. The refuse amounted to 7½ per cent. of the coal burned. Much soot was found and some trouble was caused by its igniting in the chimney. When using this coal it is necessary to reduce the calorimeter of the bridge wall, and in the Albatross this was made one-seventh the area of the grate. To reduce the consumption the grate surface was reduced from 58½ square feet to 45 by bricking off the back. It was easy to burn 20.7 pounds per square foot of grate per hour, and in order to keep the consumption of coal down to this allowance it was necessary to clean each furnace of chinker only once every 12 hours. The steam generating power of the coal was from 75 to 80 per cent. of that of good Welsh coal.

Wellington coal from the mines at Departure Bay, Vancouver Island, is declared to be the best fuel mined at the present time on the northwestern coast of this

tained in them renders them liable to spontaneous combustion under favorable conditions. Of course each colliery owner strenuously denies that his particular coal has this dangerous property, but the testimony of responsible persons who have used these coals on steamers leaves no doubt in my mind that the Wellington and Nanaimo coals, as well as those mined near Seattle, W. T., are liable to such accidents. The following case forms part of my own experience:

"Five days after we had filled our bunkers with Wellington coal at Departure Bay smoke and fumes were observed to issue from the bunker. It was found that the covering of the auxiliary steam-pipes, which pass through the bunker, was completely charred, and that great heat had been developed in the surrounding coal. No actual ignition of the coal had taken place, but was no doubt pre-



TENSION CARRIAGE WITH STAGGERED ARM SHEAVE, MADE BY WALKER MFG. COMPANY.

Cleveland, Ohio, is in use on the Fifth Street, Twelfth Street and Eighteenth Street Cable Railroad, and the Union Railway, of Kansas City; the St. Louis Cable and Western Railway, of St. Louis; and the Butte City Street Railroad, of Butte City, Mon.

Coals of the Pacific Coast.

During the present cruise of the steamer Albatross, Passed Assistant Engineer C. R. Roelker, U. S. N., made notes regarding the steaming efficiency and other characteristics of the coals of the Pacific Coast as determined by actual use at sea on that vessel. At Lota, Chili, 170 tons of coal from the Alberto Mine were taken aboard. This coal has a dull look, with a peculiar yellowish-gray tint at the planes of cleavage; it breaks up easily in rhomboidal particles. Its bulk is about 11 per cent. greater than that of ordinary anthracite. It ignites easily and burns rapidly with large flame. It does not cake, but breaks up into small particles in the furnace, which run through the grate, unless the spaces between the bars are

continent. In steaming efficiency it is only slightly inferior to good Welsh. The rate of combustion was limited to 18½ pounds per square foot of grate. It formed about 12½ per cent. of refuse and trouble was caused by the burning of the soot deposited.

The Nanaimo coal, supplies of which were obtained at Unalaska, Aleutian Islands, and at Kadiak, does not differ greatly from the Wellington in general characteristics. It was found to be 13 per cent. inferior to the Wellington in steaming efficiency and the amount of refuse produced was 14 per cent. The supply obtained at Kadiak had been exposed to the weather and had deteriorated to such an extent that its steaming efficiency was 18 per cent. less than that of the coal received at Unalaska, while the refuse amounted to 19 per cent.

The foregoing we condense from the *Journal* of the American Society of Naval Engineers. Concerning the spontaneous combustion of these coals the report says: "All the coals mined at present on the northwestern coast of this continent are of relatively recent formation, and the large percentage of gaseous matter con-

vented only by the timely discovery of the danger. The steam-pipes were covered with hair felt and wrapped heavily with manila rope. The heat of the pipes was probably sufficient to evolve gases from the coal, and by a process of slow combustion of these gases additional heat was generated, causing the charring of the rope and felt covering, and accelerating at the same time the evolution of gases. If this process had been allowed to continue a point would soon have been reached where only a liberal supply of air was wanted to produce active combustion of the coal.

"The coal came fresh from the mine, and, as there was a slight rain falling at the time, it was somewhat wet when put into the bunkers. No signs of unusual heat in the bunkers had been observed on any former occasion, either with Wellington or any other coal, although stored in the same manner."

Ex-Mayor Hewitt, in a speech delivered at the Chamber of Commerce in Chattanooga, startled his hearers by predicting that 100 years hence Chattanooga would have a population of 1,500,000.

MANUFACTURING.

Iron and Steel.

On Tuesday, the 19th inst., a charter was issued to the Pittsburgh Company, of Pittsburgh (charter perpetual), for the manufacture of iron or steel or both, or any other material, or of any article of commerce, from wood or metal or both: capital, \$5000. The directors are Andrew J. Lawrence, William C. King, John F. Scott, Edward H. Jbley and Fred W. Vanosten.

The National For and Iron Company, organized at Chicago, some time since for the purpose of erecting a rolling mill, have secured a very good location for their works at Burnside, which is at Ninety-third street, on the Illinois Central Railroad and the Belt road, with other railroad lines in the immediate vicinity. Contracts for the erection of the buildings and the construction of the machinery have been let. The work of erection will begin on the 1st of April. The buildings will be principally frame, with iron supporting columns, sheet-iron siding and iron roof for fire protection. The machinery will be built at Fort Wayne, Youngstown and Pittsburgh. The company now expect to have their works completed by the 1st of July.

The telegraphers, hot-bed men, drawers and chargers employed at the Edgar Thomson Steel Works, of Carnegie Bros. & Co., Limited, at Braddock, Pa., have been notified that their wages will be advanced next month. They have been paid \$2 a day, but hereafter will receive a certain percentage on all rails produced. The amount is not given, but it is considered an advance over present wages. The blowing boys will also receive an advance. It is stated that the present month's production of rails at the above-named establishment will be larger than for any previous month in their history.

No. 8 stack of the Thomas Iron Company, at Lock Ridge, Pa., produced 407 tons of pig iron week before last, which is said to be the largest yield for any one week in the history of the furnace.

From the Reading (Pa.) *Times* we take the following: "Mr. J. H. Carpenter, who had been in Reading for several days inspecting the P. and R. rail mill, on North Ninth street, with a view of leasing it for a New York party, left for the latter city yesterday afternoon. If the P. and R. company will agree to make a number of changes about the mill and give the New York party a lease for a term of years the mill will be put in working order and started as soon as possible. Tool steel will be the product of the works. The mill has been idle for a number of years, and it is said costs the P. and R. Company about \$4000 annually in taxes and keeping in repair, without any return whatever. For this reason it is thought satisfactory terms will be offered to the parties desiring to open it."

After an idleness of about six weeks, the steel tube department of the Riverside Iron Works, at Wheeling, W. Va., resumed operations last week on double turn, giving employment to about 250 men.

No. 4 furnace of the Bethlehem Iron Company, at Bethlehem, Pa., resumed operations on Monday, the 25th inst.

The crucible steel department of the Black Diamond Steel Works, of Park, Brother & Co., Limited, at Pittsburgh, was idle last week on account of lack of orders.

A charter was filed in Pittsburgh last week for the Totten & Hogg Iron and Steel Company. The capital stock is \$150,000, divided into 3000 shares at \$50

per share. The directors are Nathaniel B., George E., George A. and William C. Hogg and Robert C. Totten. One hundred and thirty-five thousand dollars' worth of the capital stock was issued to Nathaniel B. Hogg for the machinery, patents, &c., of the late firm of Totten & Co., foundrymen, formerly engaged in business in the above-named city.

The plant of the Warren Tube Company, at Warren, Ohio, which originally cost \$250,000, has been appraised several times and offered for sale, without success. The last appraisement was \$30,000. It will again be offered for sale on April 13 next.

The Tidewater Steel Works, Chester, Pa., report a gratifying demand for their fish-plates, which they are turning out very satisfactory to both customers and themselves. Among recent orders, covering part of '88 and '89, are the following: Eighty thousand pairs to Central Railroad and Banking Co., of Georgia, 30,000 to Savannah, Florida and Western Railroad, and 50,000 to New York Central and Hudson River Railroad, making an aggregate of 160,000 pairs.

The Duluth Iron and Steel Company, of Duluth, Minn., have let the contract for three 18 x 60 fire-brick hot-blast stoves to Gordon, Strobel & Laureau, Limited, of Philadelphia, together with other work. The stoves to be erected are of the Gordon-Whitwell-Cowper type.

The Cartwright Iron Works, better known as the Alikanna Mill, situated about 2 miles east of Steubenville, is to be started up on Monday, April 1, by the National Tube and Rolling Mill Company, of McKeesport. This mill was originally built with 12 single puddling furnaces and two trains of finishing rolls. The main product was to turn out light iron, with cotton ties as a specialty, but since the spring of 1882 it has been idle. It has been enlarged recently and there are now 20 single and one double puddling furnaces, with a capacity to turn out about 45 tons of muck iron a day. All of this iron is to be rolled into pipe iron and shipped to the pipe mill at McKeesport.

At the annual meeting of the St. Louis Ore and Steel Company, held at St. Louis recently, the following board of directors was elected: R. M. Olyphant, H. G. Marquand, Le Grand B. Cannon, M. Dwight Collier, R. M. Hoe, Jr., R. S. Grant, Geo. B. De Forrest, E. A. Hitchcock, O. L. Garrison, Geo. Henry Warren, Jr., H. M. Olmstead, Solon Humphreys and Chester Griswold.

Notices have been posted in the rolling mills of the Columbia Iron Company, at Lancaster, Pa., that after April 6 \$3.50 per ton will be paid for puddling iron and other ton men in proportion. The management say that either a reduction or complete shut-down is necessary. The Penn Iron Company, of that city, have also posted the same notice of reduction.

The strike at the Wheeling Steel Works, at Wheeling, W. Va., which was inaugurated on January 1 last, has finally been settled by the signing of a wages scale substantially the same as that of last year and the reinstatement of all old employees. The Knights of Labor controlled the mill last year, but the Amalgamated Association presented a scale for the new year and, on its rejection by the firm, ordered the strike. The present agreement was made with the employees irrespective of organization, and holds good till December 31.

The works of the Novelty Steel Wheel Company, recently organized at Pittsburgh, will be located at Bissell, on the Baltimore and Ohio Railroad, about 15 miles from Pittsburgh. The works will consist of an ironclad building, 50 x 200

feet and two stories high. The following officers were elected at a recent meeting of the company: President, W. W. Acheson, of Pittsburgh; vice-president, William O'Bryon, of McKeesport; secretary, Joseph Painter, of Kittanning; treasurer, James L. DeLong, of McKeesport; superintendent, John McGeorge, of Washington.

G. E. Beach, P. Durack and John Taylor are a committee for the organization of the Minneapolis Iron and Pipe Works, with an office at 306 Hennepin avenue, Minneapolis, Minn. It is proposed to establish in or near Minneapolis works for manufacturing cast-iron pipe for gas and water, waste-pipe for buildings, &c., the plan being to start during the present season with a paid-up capital of not less than \$50,000.

H. S. Fleming, superintendent, reports that No. 1 Furnace of the Cameron Iron and Coal Company, at Emporium, which was blown out for some weeks for repairs, resumed on the 11th inst., and is now doing good work in foundry iron.

The Fowler Steel Car-Wheel Company, of Chicago, have determined to erect a steel plant to make steel by the Robert process, introduced into this country by J. W. Bookwalter. They will make steel exclusively for their rolled steel car-wheels, casting the blanks in a steel foundry which is also to be erected at their works. They will at first put up one converter to hold a charge of 1½ tons, but their plans provide for two converters. Their foundry when fully completed will have a capacity of 250 wheel blanks a day. Contracts are being made this week for the buildings and machinery. The company hope to have their steel plant in operation by the 4th of July.

Machinery.

The Cleveland Twist Drill Company, of Cleveland, have moved from their old quarters to their new and commodious shop, corner of Lake and Kirtland streets, in that city. They have added new machinery to their already large plant, and expect to double their capacity in the next six months. They have been established since 1874, and their products are shipped all over the country.

The Aetna Machine Company, of Warren, Ohio, recently received an order from the Eureka Iron and Steel Company, of Wyandotte, Mich., for one of M. V. Smith's gas furnaces, producer and valves.

Francis Whitaker & Sons, of East St. Louis, have placed their order for all their steam pumps for their new packing house at Wichita, Kan., with the Laidlaw & Dunn Company, of Cincinnati, Ohio. All of them are Standard Duplex pumps. The Laidlaw & Dunn Company have also sold two 300 horse-power Galloway boilers to the Geo. H. Friend Paper Company, of West Carrollton, Ohio, for their new paper mill.

An order has been received at the machine shops of the Pennsylvania Railroad Company, at Altoona, Pa., for 15 new class "A" anthracite locomotives. It is stated that another similar order will follow at an early date.

Within the last six weeks the Westinghouse Machine Company, of Pittsburgh, have shipped 13 steam engines, each of over 200 horse-power, to foreign countries. Six of them went to London, England, to be used on electric light plants; one was sent to Truro, Nova Scotia, another to Chili, one to Montreal, Canada, and two to Toronto, Canada; one to Copenhagen, in Denmark, and the last one went to Moscow, in Russia.

The Porter Foundry and Machine Company, of Allegheny, Pa., have completed their contract for the engines, boilers and special machinery for the Howard Plate

Glass Company, of Duquesne, Pa., and have just contracted to build eight pairs of their engines and four extra boilers, making 18 in all, for the Standard Plate Glass Company, Butler, Pa.

The St. Louis Iron and Machine Works, of St. Louis, Mo., again have a contract for a hydraulic brick press, which they are to furnish within 60 days. They are also building two of their own Lion dry presses. They have built all the hydraulic presses now in use.

W. F. Sauter, of the firm of Godfrey Rebmann & Co., has purchased E. L. Harrington's interest in the business of The Moore & White Company, manufacturers of friction clutches, &c., 1812 Buttonwood street, Philadelphia.

William Tod & Co., founders and machinists, of Youngstown, Ohio, are building a pair of blooming mill engines for the Chester Rolling Mill Company, at Chester, Pa., which are worthy of special notice. The bed is 30 feet long, and is extended so as to carry the countershaft, all formed from one casting. The cylinders are 30 x 48 inches, and the two engines are solidly joined together so as to act on the shaft. The links are supported centrally and the reversing gear is controlled by a hydraulic engine.

The employees in the machine shops of the Pennsylvania Railroad Company, at Altoona, Pa., have been notified that hereafter nine hours will be considered a day's work, with a half-holiday on Saturdays. This affects about 4000 men.

Sebastian, May & Co., of Cincinnati, Ohio, are sending out a "sheet" of illustrations of their improved machines. The sheet just received is devoted mostly to lathes, from their 8-inch hand lathe to their new 18-inch power-engine lathe. There are also shown drill presses, engines and boilers, portable forge, emery grinding machine, &c.

We have received from the Babcock & Wilcox Company a copy of their new edition of "Steam," which has been rewritten and enlarged by the addition of new matter. Although this book is issued primarily in the interest of the Babcock & Wilcox boilers, yet it has always contained so much original matter of direct value to the engineer as to make it in many respects a standard of reference. We congratulate our contemporary "Steam" upon its enhanced value and improved appearance, especially in regard to board covers within which it is now incased, and expect to soon avail ourselves of its courteous invitation to select from its columns.

The Cady Mfg. Company, of Cleveland, Ohio, have recently incorporated, and elected as officers R. C. Moody, president; Frank P. Cady, vice-president, and Irving A. Brown, secretary and treasurer. They will engage in the manufacture of machinery and will make a specialty of machines for the working of wire into all of its forms. Mr. Cady, who has charge of the mechanical department, is well known to the trade as being the inventor of the link barb fence and numerous other inventions in wire. The new company have already secured contracts for building machines for the manufacture of wire chain and wire coat and hat hooks which will keep them busy for two or three months to come.

There is a movement on foot among the manufacturers of wood-working machinery to hold a convention for the purpose of discussing matters relating to their business. The aim of the projectors is to bring about a proper adjustment of the conflicting opinions as to the best methods of serving their customers. Lumbermen and wood-workers are to be consulted in order to better understand their wants,

that improvements may be made and a uniform standard be adopted in quality, sizes and systems. The Egan Company, of Cincinnati, Ohio, have taken the initiative in this direction, and are bringing about the necessary steps to have the builders of wood-working machinery come together at an early day.

The Pond Engineering Company, of St. Louis, Mo., have just issued a catalogue describing their system of steam plants for driving dynamos. This company are prepared to furnish and erect high-speed engines, Corliss engines, steel boilers, water-tube boilers, furnaces, heaters, pumps, injectors, belting, pipework, foundations, &c.—all specially adapted for electrical service.

Riehle Bros., Philadelphia, report the following orders: A 20,000-pound horizontal testing machine for the Bridgeport Brass Company, Bridgeport, Conn.; a 20,000-pound vertical testing machine for the United States Naval Academy, Annapolis, Md.; one rope twister to Columbus Iron Works Company, Columbus, Ga.; one turntable and two pig-metal trucks for the New River Mining Company, Ivanhoe, Va.; a furnace charging scale each to the Stickney Iron Company, Baltimore, Md.; to the Mont Alto Iron Company, Mont Alto, Pa.; to Joanna Furnace, Joanna, Pa., and to the Struthers Furnace Company, Struthers, Ohio; one 200-ton forcing press to Providence, R. I.; two 4000-pound rolling mill scales to Newark Steel Company, Newark, N. J.; one 30-ton railroad track scale to the Phoenix Iron Company, Phoenixville, Pa.; a pipe proving press for the Pennsylvania Pipe Mfg. Company, and platform scales to Johnson Foundry Company, Johnstown, Pa. This firm have recently filled large orders for their platform scales for South America.

Hardware.

St. Louis Shovel Company, St. Louis, Mo., during the past month have doubled their capacity by the introduction of considerable new machinery. They report the outlook as very promising for a large spring trade.

The I X L Pump, Lumber and Mfg. Company, Goshen, Ind., in addition to their line of Wood Pumps, have recently added sash doors, blind and screen doors, and are also giving attention to furnishing building materials, all of these lines being represented in the catalogue which they issue.

Wood, Smith & Co., Fort Plain, N. Y., announce that a slight fire occurred in the foundry department of their spring and axle works on the night of the 19th inst., but that they will be in full operation again in a very few days, and that they have a large stock of goods and boxes on hand, there being but little interruption in their business.

F. F. Adams Company, Erie, Pa., report that they are fully occupied in filling orders for milk shakes, cork pullers, wringers, &c.

The Enterprise Mfg. Company, of Philadelphia, report that notwithstanding their strike they are now running 36 parties. They have contracted with outside parties for 100 tons of castings, which are being furnished them in regular shipments. Last week the strikers attempted to intimidate the new men, but one of the leaders was arrested and placed under bail, which terminated this effort on their part. The company announce that it is their intention to run their foundry independent of any labor organization.

Miscellaneous.

At the annual meeting of the Republic Iron Company's stockholders, held recently at Cleveland, Ohio, the old board

of directors of the company was re-elected to serve for the ensuing year, and at the meeting of the board to choose officers of the company which followed the old officers were also elected for another year. The board of directors is as follows: Charles Hickox, Peter White, J. V. Painter, Charles G. Hickox, G. W. R. Matteson, Henry B. Perkins, Samuel P. Ely, Joseph Perkins, William D. Rees. The officers are: President, Chas. Hickox; vice-president, Samuel P. Ely; auditor, Douglas Perkins; secretary, treasurer and general manager, William D. Rees.

St. Louis Lead Company, St. Louis, Mo., manufacturers of babbitt metal and solder, are running full time and have enough orders booked to occupy them actively for the next three weeks. They make a specialty of fine engine babbitt, for which they have a large trade.

THE WEEK.

California expects to gather three months hence the largest wheat harvest ever seen in the State. The fruit crop will include 1,000,000 boxes or 2000 carloads of oranges.

The firm of Henry R. Worthington, of this city, who put the pumps in the Inman steamship City of Paris, received a cable dispatch that the vessel made 22 knots an hour on the trial trip, and the machinery and pumps worked satisfactorily.

An illustration of the demand for American products which exists in foreign countries is given in an account that Sir Charles Dilke has recently written of a trip which he made last fall to the Afghanistan borders of India. The Indian Government is building railroads well into the domain of the Afghan Ameer, for the defense of India against a future Russian attack. To complete this strategic system a long railroad tunnel has to be constructed, and Sir Charles in visiting this work noted with surprise that the timber used for bracing and lining this extensive work was all brought from Washington Territory.

Gen. R. A. Alger, of Detroit, has made large purchases of timber and coal lands in Tennessee.

Although it was recently reported that one of our principal railroad companies had become dissatisfied with iron ties after experiment, C. P. Huntington says he will use iron ties for his entire system known as the Southern Pacific if he can get moderate American prices.

In the Canadian Parliament a protracted discussion upon the subject of unrestricted trade with the United States has just closed, giving an opportunity for the Montreal *Casette*, Government organ, to remark that the effect will be good: "Let it be grounded in the minds of the electors that free trade with the United States involves disruption of British connection, the opening of our markets to the surplus products of the neighboring republic, the surrender of tariff control, the imposition of the high American tariff, and resort to direct taxation in exchange for the liberty to send a few products across the line free of duty, and there need be no fear of the result of an appeal to the country on this issue."

A suit to test the constitutionality of the Chinese exclusion act is on trial in the Supreme Court in Washington. The appellant is a Chinese laborer, whose certificate entitling him to a domicile in the United States, obtained in accordance with law, was declared void by the Collector at San Francisco. Solicitor-General Jenks has filed the brief for the Government and is assisted in presenting the case

to the court by Hon. John F. Swift, of California, the recently appointed Minister to Japan. The brief for the Chinaman is filed by Judge George Hoadley and James C. Carter, of New York.

It appears from the complaints of stockholders that a great deal of money has been made and squandered by persons interested in what is known as Leaycraft's invention, consisting of a kind of aerial railway which has been introduced in stores in New York, Philadelphia and Boston as a substitute for "cash boys." It is now alleged that the property is being wrecked for the purpose of creating a monopoly.

Several Japanese nobles from Tokio, after examining American naval vessels and equipments, will leave this city for France, where two vessels of 8000 tons are building for the Japanese navy.

The Naval Board at Washington report that the gunboat Yorktown has been completed in accordance with the contract.

Chief Engineer Green, of the Dock Department, contends that piers in New York City should be 700 feet long. It becomes the duty of the Secretary of War to see that the navigable waters of the harbor do not suffer from encroachments.

It is conclusively shown that the gold mining excitement in Lower California, which has paralyzed all legitimate business on that part of the Pacific Coast for some weeks past, is part of a scheme to promote colonization and other speculative objects. San Diego, where Boston parties are largely interested, is charged with sharing in the responsibility for the craze which has proved disastrous to many rash adventurers.

The enormous cost of the "Q." strike is phenomenal in the record of labor disturbances. The detailed statement of expenses which the Chicago, Burlington and Quincy gives in its annual report presents, when compared with 1887, many striking facts. The engine service increased by \$1,078,404 to \$4,177,948; repairing locomotives increased by \$871,872 to \$1,333,494, and miscellaneous loss and damage increased by \$623,877 to \$936,660. Here are three items of increase mainly due to the strike, amounting to \$2,074,365. Boston believes that "as the outside lines must have lost by the strike a million more in increased expenses and loss of business, the total cost of this strike must have been not far from \$5,000,000, or 6½ per cent. upon the share capital."

The Phoenix Bridge Company have completed a 3-span iron bridge across the New River, at River View, W. Va., for the Chesapeake and Ohio. One span is 300 feet long, one 250 feet, and the other 200 feet. Over 40 new iron bridges of all sizes on the line of the road are being built by the Phoenix Bridge Company, the Edge Moor Bridge Works, and the Passaic Rolling Mill.

The Southern negro being to such an extent "a producing automaton," there are some who regard his position to-day as one of no small danger, if not from an increase beyond the demand for labor then by reason of the introduction of labor-saving machinery. A South Carolina paper says: "One important source of his earnings is cotton-picking, on which he earns, at a low estimate, \$5 per bale of lint cotton. A machine has been invented and perfected up to the point of an entire working success which will pick the cotton as it stands at a nominal cost and dispense with all hand work. The general use of such a machine would save, upon a crop of 6,000,000 bales, hand-picking which now costs \$30,000,000 per annum. This machine could become available to the smallest planters through hiring it as

reapers are now hired." Respecting the destiny of the negro, the fact is significant that after 25 years of freedom the colored race in South Carolina own only about 5 per cent. of the entire cotton lands, including those that were so held before the war.

A letter from Honduras speaks of the exceedingly primitive condition of that country, and particularly of the lack of the means of internal communication, closing with the statement that "with a position unequaled, a climate adapted, as one might say, to every caprice, the finest forests of the earth, untold mining wealth and opportunities for agriculture, it can be but a few years before Honduras will take the first place among the republics between the Rio Grande and the Isthmus."

One of the deck spans of the New London bridge across the Connecticut River has been erected, and it is hoped that all the superstructure will be up and ready for trains before the end of July. This bridge is remarkable as having the heaviest and longest draw span yet undertaken anywhere in the world, being 503 feet between centers and carrying two tracks.

The contractors for convict labor at the State prison in Trenton, N. J., have unanimously refused to renew their contracts with the State unless the law of 1887 governing the same is repealed. That law requires that all goods made in the prison shall bear a tag, stamp or label showing that they are manufactured in that institution. The contractors say that the mark will greatly lessen the sale of the goods and cause prices to deteriorate.

Claus Spreckels, just from Honolulu, says the Hawaiian sugar crop will be about 125,000 tons, the largest ever known.

The trustees of the I. V. Williamson Free School of the Mechanical Trades have purchased about 205 acres of land in Delaware County, Pa., between Elwyn and Glen Riddle, and about a mile and a half west of Media, as a site for the institution. The average price was about \$225 an acre.

Thirty additional electric cars, to be used on the Fourth and Madison avenue surface road, have been ordered. They will run with the storage battery system.

The Government proposes to expend \$6,200,000 in fitting League Island for a naval station, making it the most important in the country. Jas. E. Simpson & Co., of New York, have contracted to build a dry dock to cost \$550,000, and are making the preliminary borings, which are unexpectedly favorable. It will be a wooden structure, 500 feet long, 130 feet wide in the body, 80 feet at the entrance, and will accommodate at low tide a vessel drawing 25 feet of water. From the floor of the dock to the upper edge will be 35 feet, perpendicular height. The material employed will be yellow pine and oak.

A movement has been begun in Paterson, N. J., for the establishment of a technical school, where designing, weaving, dyeing and furnishing will be taught. The movement is a strike at trades unions, which do not allow more than one apprentice to a certain number of weavers. "The aim is to broaden the scope and enlarge the field, and have a market abroad for the goods we manufacture at home."

In the thriving town of Charlotte, N. C., a number of sites have been placed at the disposal of the Chamber of Commerce, to be donated to manufacturers who will locate there permanently.

Three successive gas explosions in the electric subway near the junction of Broadway and Fifth avenue on Monday afternoon have thoroughly aroused the Subway Commissioners to the necessity for measures to prevent their recurrence, and

the Board of Electrical Control has notified the several gas companies that they must take immediate steps to prevent the escape of gas from their mains. No live wires are in the subways blown up by these repeated explosions. The plan is to force air through them by steam power.

The Secretary of the Navy has approved the report of the trial board of the York town, and the vessel, including her fittings and machinery, will be accepted, subject to the special reserve of \$20,000, and to a further reservation of \$5000, to be held until the lighting plant shall be completed and tested.

Bills from New York City introduced into the Legislature propose appropriations aggregating \$19,541,000. If they become laws the city debt will be increased to within \$4,000,000 of the amount limited by law, which is 10 per cent. of the valuation of the real estate.

The students in mechanical engineering in Cornell University are going through the principal industrial works in this city, and find much to engage their interest.

The entire work on the Panama Canal was inspected by Captain Edwards, of the British steamship Jamaica, arrived at New Orleans. He says that large quantities of abandoned machinery are strewn on the line of the canal, on which steam had never been raised.

The famous mansion in Elizabeth, N. J., known as "Dimmock's folly," built at a cost of \$240,000 by Anthony W. Dimmock, at one time president of the Pacific Mail Steamship Company, has been presented to the city by Joseph A. Batten, a wealthy citizen, and will be devoted to educational purposes.

After nearly three months of dilly-dallying in the New York Legislature, a bill designed to restore productive labor in the prisons has been made the special order for to-day. The bill was reported from the Assembly Committee on Prisons by Mr. Savery and provides that the Superintendent of Prisons, the President of the State Board of Health, the President of the State Board of Charities and the Commissioner of Labor Statistics shall constitute a board to determine the number of convicts that may be employed in any single industry, and to select such industries as may be carried on in the prisons, choosing those which shall least conflict with outside labor. There are strong hopes that this measure or its equivalent in some shape will be passed through to success.

Work is in progress in erecting the iron superstructure for the new elevated railroad in Fifth avenue, Brooklyn.

A renewed effort is making to utilize the swamp lands adjacent to the Brooklyn Navy Yard, and it is intimated that the Washington authorities may soon decide to relinquish all title to the same, so that a park may be laid out or market buildings erected, or that a temporary lease of these lands to the city may be executed, with the understanding that in case of war the use of the property shall revert to the Government.

Mexican papers remark that American capital is being withdrawn from that country, and that English capital is coming in, controlling mines and railroads. The Central Railway line has become substantially an English corporation, and the Inter-oceanic Railway is now owned in England. Millions of dollars have been loaned for the drainage of the Mexican capital. Besides, vast tracts of land in the border States have passed into the possession of Englishmen. The *Financier* says that the English are acquiring a hold on the transportation system of that country that can never be shaken off.

The Iron Age

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DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF, JR., - EDITOR.
GEO. W. COPE, - - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS, - - - HARDWARE EDITOR.
JOHN S. KING, - - - BUSINESS MANAGER.

THE IRON AGE INDEX.

The Index for Vol. XLII is now ready, and will be sent to subscribers on application.

Two Supreme Court Decisions.

We noticed in our news columns recently the decision of the United States Supreme Court in the case of the Liverpool and Great Western Steam Company *vs.* the Phoenix Insurance Company. The points of the case make it an important one to all shippers. The point of most consequence to the public was clearly before the court. This was the right of the steamship company to exempt itself by a bill of lading from liability for its own negligence. On land, in spite of some doubtful decisions, the courts have very generally held that a carrier could not plead the bill of lading in cases where damages occurred through its own negligence. On the seas, however, the reverse has been the case. Every conceivable marine risk has, by slowly-growing custom and by terms of the marine bill of lading, been shifted from the ship to the owner of the goods. A clause in the bill of lading relieves the company from loss arising from the negligence, default, or errors in judgment of the navigators of the vessel. In the present suit it was proved that the stranding of the ship *Montana* on the coast of Wales was due to negligence, so the ship-owners fell back upon the bill of lading. The Supreme Court enters into a long and exhaustive consideration of this clause, and reaches the conclusion that the fundamental principles of transportation will not permit any carrier, by land or by sea, under any circumstances, to contract to escape payment of losses due to its own negligence.

It must be confessed that to an unprejudiced mind the carriers by water appear to have long had things too much their own way. Limitation has followed limitation until no liability at all was left. Our merchants who ship largely abroad or on our inland lakes will be glad that marine risks will now be put upon a footing equitable to both carrier and shipper. The alarm felt by the steamship people seems to have somewhat subsided. Even under the new construction, the fact of negligence must be proved against the officers of a vessel before recovery is possible. The utmost effect, therefore, will be the shifting to the ship-owners of part of the expense of the insurance for the possibility of getting back the amount of the policy in cases of negligence and will probably result in a lowering of the insurance rate.

Another decision of the same court is in the same line. The case of *Inman vs. the South Carolina Railway* turned upon the

subrogation clause in bills of lading. These generally contain a clause to the effect that the carrier shall have the benefit of any insurance which may have been effected upon the property destroyed. The New York Court of Appeals and other courts have upheld the right of the railroads to make such a stipulation. The insurance companies, alive to the situation, also inserted clauses in their policies to the effect that they (the insurance companies) should, in case of loss, become owners of any claim which shippers might have against the offending carrier. These contradictory clauses have caused much confusion, both railroad and insurance companies insisting upon their contracts, each against the other. The Supreme Court now settles the general principle by affirming the right of the owner to sue the railroad for his loss (in this case cotton destroyed carelessly by fire) in spite of the subrogation and allowing the owner's claim against the insurance company to wait until the measure of the carrier's liability could be judicially determined. This is in line with common sense, which forbids any technical discharge of a railroad from its common law liability for damages to goods in its keeping. If any company should pay for a loss caused by negligence, it should be first of all the company which was negligent.

American Tin Plates.

President O. W. Potter, of the North Chicago Rolling Mill Company, states that one of the purposes which he expects to see accomplished by the consolidation of Chicago steel companies is the manufacture of tin plate. The erection of a special plant devoted to this object is seriously contemplated. The field is an inviting one to enter, because tin plate is not now manufactured anywhere in this country, while the consumption is enormous, furnishing a large business to the tin-plate works of Wales and England. Every other branch of the iron and steel industry has been thoroughly established on this side of the Atlantic, and our productive capacity is in excess of the present demand in almost every line. An American establishment which could manufacture tin plate at even a slight profit would for some considerable time enjoy a trade largely its own. Mr. Potter believes that the high quality of Lake Superior ores would produce a steel eminently suitable for the production of sheets to be coated with tin. Some of his new associates in the consolidated companies are known to have been very strongly impressed for a long time with the desirability of domesticating the tin-plate trade, and have given the subject much thought and careful investigation. The ample resources at the disposal of this great organization, together with the strong array of mechanical skill and scientific attainments which the combined forces of the three companies will muster, should certainly be able to satisfactorily solve the problem how to produce tin plate here in successful competition with the foreign article. If the depressed condition of the steel-rail industry and the enforced search for other avenues of trade should lead to the creation of a new and most important industry, the decline in rails will indeed prove to

be a blessing in disguise. President Potter and his associates will deserve much credit if this result is accomplished through their efforts. In 1865 Mr. Potter was present at the rolling of the first steel rail made by an American mill, and he asserts that there is quite a strong probability that he may witness the first American tin plate made in the successful introduction of the business on a sound commercial footing—and Chicago the scene of both achievements.

Rapid Transit in New York.

Any thorough and well-considered plan for rapid transportation in this city must have reference not only to durability of construction, but must provide for demands based on calculations of future growth. There is no reason why New York should not become one of the most populous centers on the globe, attracting to itself trade and population from across seas and continents. The topography of Manhattan Island is such that the main thoroughfares must of necessity be longitudinal rather than lateral. Moreover, it is obvious that all obstruction to the most feasible route, whether natural or artificial, above ground or subterranean, must eventually yield to the pressure for right of way and at whatever cost. Within a comparatively brief period we have seen the entire shipping of the harbor, with few exceptions, change from wooden sailing vessels to great iron ships propelled by steam. In like manner the advent of the steam motor for land transportation and of cables and electricity must speedily drive out all antiquated methods. The horse-car must go, following the omnibus. The extent to which property valuations are influenced by facilities for transit—always a primal consideration—is indicated by the single statement that in the four years immediately subsequent to the opening of the elevated railroads, from 1879 to 1882 inclusive, the assessed valuations of real estate in the city of New York increased by the sum of \$134,848,316. During the following four years—from 1883 to 1886 inclusive—the increase of assessed valuations of real estate in the City of New York was \$178,544,062, making a total increase for eight years of \$312,892,678.

The ability of a passenger to move 11 miles in 33 minutes—that is to say, from Wall street to 155th street—and to make this change of locality without personal discomfort is a commercial fact of wide significance in its bearing upon local improvements. Of late the necessity for improved rapid transit has come prominently into view. Not to speak of the financial success of Jacob Sharp's Broadway scheme, which must have whetted the appetite of investors, ex-Mayor Hewitt boldly put himself on record as favoring heroic methods. He is a full believer in a viaduct system at any cost. More recently came a decision from the Supreme Court, summarily sweeping away several moribund projects and by removing legal impediments inviting new enterprise. Mayor Grant next appears in the arena, warmly espousing the cause of rapid transit and urging the need of improved facilities. At this point Jay Gould becomes apprehensive lest some formidable rival should impair the value of his interests represented by the elevated railroads. Addressing Mayor

Grant in a carefully prepared communication, Mr. Gould claims from the people of New York some consideration for his property. The Manhattan road, in his judgment, offers a solution of the whole difficulty. He shows that on an extraordinary occasion they can, even with their present equipment, transport 700,000 passengers a day. Only grant permission to put a third track on Third and Ninth avenues, with adequate terminal facilities at City Hall Park and the Battery—"loops," as he calls them—and the thing is done. But Mr. Gould's methods are severely criticised, and his judgment called in question. Obviously no temporary expedient or make-shift will satisfy the clamor for works of a permanent character, adapted to the future wants of a city already imperial in its greatness, although yet only on the threshold of its existence. To provide for generations yet unborn is less a source of worry with some people than the more pressing question of fat dividends for those who yet survive. As the case stands viaducts have the preference.

Four Years of Gold and Silver Production.

Silver has so far this year been remarkably steady in the London market, the ounce being worth 42½d on January 1 and 42½d on March 22. The only thing of interest that occurred having a bearing on the silver question has been an application to the German Treasury office by Rardroff, the bimetalist, and consorts requesting the same to induce the Federal Council to declare its readiness to co-operate at any time with England toward the restoration of silver as a standard should the latter take the initiative in the matter. The treasurer declined to make any such declaration beforehand; it would be different, he added, if the German Parliament passed a resolution to that effect. Meanwhile some additional light has been thrown on the silver question by the publication in detail of the production of the precious metals at large during the four years 1884 to 1887, both inclusive, and certain figures published by the Indian Government. The production of the precious metals in different countries was as follows:

United States.					
Gold.			Silver.		
	Kg.	Dollars.	Kg.	Dollars.	
1884....	46,244	32,500,000	1,174,206	44,000,000	
1885....	47,848	33,500,000	1,341,573	45,000,000	
1886....	52,663	37,000,000	1,227,141	41,000,000	
1887....	49,654	35,000,000	1,283,855	42,250,000	
Russia.					
1884....	32,913	23,000,000			
1885....	38,126	26,500,000			
1886....	30,872	21,500,000			
1887....	30,233	21,000,000			
Australia.					
				Value only.	
1884....	42,558	29,500,000		\$180,000	
1885....	41,287	29,000,000		900,000	
1886....	39,761	28,000,000		1,000,000	
1887....	41,119	29,000,000		200,000	
Mexico—Government Report.					
Gold.			Silver.		
	Kg.	Dollars.	Kg.	Dollars.	
1884....	1,780	1,250,000	653,870	24,600,000	
1885....	1,804	900,000	772,679	28,000,000	
1886....	924	700,000	794,033	28,500,000	
1887....	1,240	850,000	904,000	30,000,000	
Mexico—Private Report.					
	Gold.		Silver.		Total.
1878.....	\$747,000	\$24,837,000			\$25,584,000
1879.....	881,000	25,125,000			26,006,000
1880.....	942,000	26,800,000			27,742,000
1881.....	1,013,000	29,234,000			30,247,000
1882.....	937,000	29,329,000			30,266,000
1883.....	966,000	29,508,000			30,525,000
1884.....	1,065,000	31,065,000			32,750,000
1885.....	914,000	33,226,000			34,140,000
1886.....	1,028,000	34,112,000			35,138,000
1887.....	1,047,000	34,600,000			35,647,000
1888.....	1,081,000	34,912,000			35,943,000
Totals.....	\$10,549,000	\$333,439,000			\$343,988,000

South America—Colombia, Venezuela, Brazil, Peru, Bolivia, Chili.

Gold.			Silver.		
	Kg.	Dollars.	Kg.	Dollars.	
1884....	14,700	10,250,000	376,000	14,100,000	
1885....	13,000	9,000,000	521,000	18,750,000	
1886....	11,100	8,000,000	558,000	18,700,000	
1887....	11,100	8,000,000	511,000	18,900,000	
Germany.					
1884....	555	400,000	243,118	9,275,000	
1885....	1,373	1,000,000	309,418	11,000,000	
1886....	1,037	750,000	319,598	11,250,000	
1887....	2,251	1,600,000	367,633	12,500,000	

Gold and silver are produced besides to a moderate extent in Austria, Hungary, Spain, Norway, Africa and Canada, and from imported ores, &c., in England, Germany and France.

Total Production.

Gold.			Silver.		
	Kg.	Dollars.	Kg.	Dollars.	
1884....	153,017	108,750,000	2,665,386	100,000,000	
1885....	156,108	108,900,000	2,954,706	106,400,000	
1886....	149,355	104,200,000	3,027,632	106,320,000	
1887....	149,048	101,400,000	3,259,144	107,550,000	

Proportion of Value.

	Percent.	Percent.
1884.....	51.8	48.4
1885.....	50.8	49.4
1886.....	50.7	49.3
1887.....	48.6	51.4

The international trade balance of British India was as follows, in thousands of rupees:

	Export.	Import.	Excess of export.
1872-1877. { average }	591,870	356,500	235,370
1885-1886....	838,810	556,590	282,220
1886-1887....	884,700	617,770	266,930
1887-1888....	905,440	650,050	255,390

The movement of precious metals and council bills was:

	Excess of gold import.	Excess of silver import.	Council bills.	Average exchange.
1872-1877. { average }	15,102	83,214	146,824	21.87
1885-1886....	27,630	116,000	152,380	18.25
1886-1887....	21,770	71,500	175,340	17.44
1887-1888....	29,890	92,190	216,240	16.89

The trade balance of India is becoming more unfavorable to it, and the money required to cover current indebtedness in England cannot be covered any more as easily as formerly by an increased export of merchandise. This is one of the chief causes why the exchange has been steadily drooping. In other respects the silver question is such a complicated one in that vast and populous country that economists and financiers in England and India have arrived at the conclusion that nothing can be mended by interference, least of all by bimetallic interference, and that in monetary matters India must be left to shift her own course as well as she can. Besides, circumstances bearing on the question are continually undergoing modifications in India, baffling the keenest financial forethought. Hence bimetallics can draw little to comfort and support them in their schemes from the Indian aspect of the silver question, much to their discomfiture and annoyance.

An apparent paradox is noted in the price ruling for old iron rails. When they are scarce they are cheap, and when they are abundant they are dear. The supply is limited at present, and yet prices cannot be advanced above a certain point, which seems to be established by the relative price of other raw irons, and not by the laws of supply and demand as applied directly to old rails. They are a commodity advancing and declining in value in sympathy with the prices of other materials. Hence occurs the paradox, the explanation for which is simple. Extensive renewals of railroad tracks almost invariably occur when times are very prosperous, when prices are high, and when the demand for finished products at high

prices absorbs the supply of old rails taken up and for which correspondingly high prices are paid. They are then abundant yet dear. When times are hard, however, the forced economy of railroad companies interferes with renewals, the quantity of old rails thrown on the market is small and prices of finished product compel the manufacturers to beat down the cost of the materials they use. Old rails are then scarce but may be and often are quite cheap.

The Western Cut-Nail Trade.

Again the condition of the Western cut-nail trade has exhibited the singular features which have so often characterized it at this time of the year. For almost four months the factories in operation have been filling the orders which were taken in November and December at the extremely low prices which then prevailed. Those prices were declared at the time to be under cost at the best equipped factories, even those controlling their own steel supply and manufacturing their own pig iron. So unsatisfactory was the outlook at that time that some of the largest manufacturers announced their intention of running only part of their machines during the winter. They alleged that while they desired to retain their hold on the trade they could not afford to run to their full capacity on account of the very heavy loss which they would thus suffer. Yet they and their associates were apparently unable to resist the temptation to book large orders offered them, even if they could not figure out actual cost received. They were not satisfied to fill a present demand when they were taking orders in November and December, but they anticipated the future and glutted every distributing channel with nails enough to last well into the spring.

After having booked orders from everybody in the trade who could be influenced, these manufacturers put in operation the rules and regulations of an association they had organized for the purpose of "improving the condition of the trade." They made quotations for new business and adhered to them strictly. For months there has not been a whisper of cut prices by Western manufacturers belonging to this association. A few concerns outside of the organization have made some slight disturbance, but hardly enough to excite apprehension. An advance of 5 cents in the card was made, and this has been adhered to. But how much new business has been taken? If the reports of accredited agents are strictly correct, all the orders taken by the united factories since the association was formed would hardly keep one factory of any decent size in operation. The manufacturers have not been able to sell to any extent because their quotations have been above the price at which dealers were able to sell and make a very fair profit. The contracts with the factories which the dealers made have enabled them to sell a brand of nails from 5 to 10 cents per keg cheaper than the manufacturer himself could, and the orders on which he bid and was beaten have been filled from his own warehouse at his loss and the dealer's profit. An illustration of the way in which these contracts for future delivery were made in November came to our notice during the past

week. A manufacturer quoted the card rate to a small dealer who inquired the price of nails. The price named amused the dealer, who said he could beat it some 10 cents or more. Being pressed for an explanation, he said he had an unfilled contract for three carloads of nails which was made last November. The contract was really an option, to be filled at his own discretion, without limit as to time, the dealer's trade in nails being so small that a carload would last him for months. How many such options were among the "orders" booked in November and December there is no way of finding out, but until they are closed the trade can hardly be said to be in good condition or to be in shape to get into good condition.

Yet with all this to contend against there is really a faint appearance of improvement. Stocks in the hands of the large dealers are undoubtedly running low and their contracts with the factories are expiring, as is shown by the gradual growth of a firmer feeling among them. The renewal of contracts at higher prices looming up in the near future would be very likely to have this effect. If the associated manufacturers are now able to maintain their organization and will faithfully adhere to their adopted scale of prices, even though orders may be withheld for a time, or massed on a particular factory to create the impression that prices had been broken, they can possibly work their trade up to a profitable point. But much better management is needed than was shown last fall, or, in fact, for several previous seasons.

The fourth number of the *Technic*, the annual of the Engineering Society of the University of Michigan, contains many interesting and valuable contributions upon timely topics. The work most appropriately opens with an article, accompanied by portrait, giving the main facts in the life of Charles E. Green, who has for 16 years been connected with the University as Professor of Civil Engineering. Following this are articles upon cements and the raw materials from which they are made; ventilation of houses; a graphical treatment of a retaining wall for earth; long-distance distribution of electric energy; dynamics of reciprocating engines; blue printing, and a notice with portrait of the late Prof. Byron W. Cheever. The number closes with an illustrated description of the new physical laboratory and the engineering laboratory. The latter is divided as follows: Mechanical and steam engineering, machine-shop, carpenter and pattern-shop, forge and foundry, engine-room, drafting-room. The mechanical and steam engineering laboratory will eventually contain all the apparatus necessary for conducting experiments to determine the efficiency of machines and to make tests of the machines employed in engineering construction. The tests will be conducted by the professor giving instruction on the work involving the tests.

The Louisville Realty and Improvement Company, of Louisville, Ky., are a corporation recently perfected in that city. The company are capitalized at \$1,000,000, and have purchased land worth \$700,000 on the western boundary of the city and situated on the Ohio River. This company was projected to secure the establishment here of the American Fire-Proof Steel Car Company by offering them a manufacturing site and other inducements. This latter company, who have a capital of \$1,500,000, will probably soon begin the erection of shops, as they have a num-

ber of orders for their fire-proof cars from Western roads. The land company have assurances of the erection on their land of a number of enterprises, among them a large steel bridge works who are now at work further North.

CORRESPONDENCE.

Advantages of Manganese in Iron Ores for Furnace Practice.

To the Editor: That manganese is a valuable element in iron ores when present in proper and regular proportions is a fact well known to most of the large steel rail companies of this country who have been in the habit of purchasing large quantities of iron ore containing from 3 to 5 per cent. of metallic manganese, which they use in mixture with other ores containing little or none, in the manufacture of Bessemer pig iron. Many other steel companies who manufacture Bessemer pig iron which goes into nails, billets and merchant steel have recently perceived the advantages of an ore containing 50 to 60 per cent. iron and an average of 4 per cent. of manganese, and its use in Pittsburgh, Wheeling and other Western manufacturing blast-furnace districts has become quite prevalent. It is their practice to use from one-eighth to one-fourth of such a grade of ore on their furnace burden, according as to whether they wish to get one-half of 1 per cent. of manganese in their Bessemer pig iron, or three-fourths to 1 per cent.

Its advantages are twofold: First, in furnace practice, where the presence of manganese in their ore mixture tends to a more rapid working of their furnace, aiding materially the yield of the furnace in the amount of pig iron produced, and also by its action in keeping the lining walls of the furnace smooth and free from agglomerations that are apt to accumulate there. Second, the affinities of manganese for sulphur, oxygen and carbon being very energetic, render the presence of manganese in Bessemer pig iron very valuable to eliminate oxygen in steel, sulphur in pig iron, and for the obtaining of high carburized pig. In the Bessemer converter manganese present in the Bessemer pig iron in the proportion of 0.75 to 1 per cent. prevents "during the blow" the oxidation of so much iron. It prevents the absorption of much oxygen in the bath of steel, and insures more solid steel with less blow-holes and with less oxygen in the final product, which is most important to prevent cracks or flaws in the rolling or hammering of the steel. It is generally accepted that the quality of the steel is improved when made from iron carrying about 1 per cent. of manganese, and most of the Western steel companies find that by careful attention in the use of manganese in the Bessemer pig iron they can use up to 1 per cent. with very good results. Beyond that there is perhaps a loss in metal which is not compensated for by the beneficial effects of the manganese in the pig iron "during the blow."

While, as has been stated above, the advantage of manganese in Bessemer pig iron is now well known and appreciated at most of the steel-converting works, its advantages in foundry pig iron are not as yet so generally appreciated, and yet the presence of manganese in foundry pig iron is most valuable to sound castings. By its fluidity it obliterates the faults of iron too rich in graphite. It takes out the shrinkage of red short iron and makes strong and clean castings. The valuable qualities of the imported Scotch foundry pig iron are well known throughout the trade, and yet few users of this iron are ably aware of the fact that the imported Scotch iron invariably contains from 1½

to 2½ per cent. of metallic manganese. We append reliable analyses of two of the best known grades of imported Scotch iron:

	Coltness.	Glengarnock.
Metallic iron.....	90.26	90.70
Silicon.....	3.89	2.83
Manganese.....	1.77	2.13
Graphitic carbon.....	3.27	2.69
Combined carbon.....	0.60	0.85
Phosphorus.....	0.44	0.54
Sulphur.....	0.04	0.04

Already in the Mahoning Valley there are being manufactured at several of the wide-awake Ohio furnace company plants a grade of iron which goes by the name of the Ohio Scotch, in which they aim by the admixture of iron ores containing manganese in uniform and proper proportions to get an iron which shall be similar to and in some respects superior to the imported Scotch pig iron. They have met with signal success, and their brands are well-known throughout the East as well as in the West as combining softness, strength and fluidity.

It is not alone, however, in foundry and Bessemer iron that the presence of manganese in right proportions is valuable. In mill iron it is equally so, although not entirely for the same reasons. During the process of puddling manganese insures a more complete elimination of sulphur and phosphorus. During the period of boiling it protects the carbon from total oxidation, leaving some in the final product or muck bar, making what is termed fine-grained or steelish wrought iron. The presence of oxide of manganese in the puddling cinder makes the same fluid, and thus prevents an excess of cinder from going into the muck bar. While the manganese melts freely in the puddling furnace, it saves in that process an equal amount of iron, and through its strong affinities for sulphur and phosphorus enables a purer product to be obtained. Abroad on the Continent, when pig iron of inferior quality is used in the puddling furnaces, a certain proportion of maganiferous pig iron is added to the mixture to improve the same. High phosphorus and sulphurous white and mottled pig is puddled with a mixture of a certain amount of low-grade spiegel, and notwithstanding the large amount of impurities in the inferior character of pig used the bar obtained is fairly good, through the beneficial action of the manganese in the spiegel.

The Eastern blast furnace maker would do well to follow in the footsteps of his Western brother by adopting the practice of the use of ores containing manganese, especially as his native ores in most instances contain sulphur in much larger proportion than do the ores used in the West, and, as above stated, manganese is especially valuable for eliminating sulphur in pig iron. EDMUND D. SMITH & Co.

PHILADELPHIA, March 25, 1889.

Louisville, Ky., will soon be using natural gas. The Kentucky Rock Gas Company have persisted, against censure and opposition, and now have the pipe line complete from the wells in Meade County, about 80 miles distant, into the heart of the city, and by the 1st of May or sooner many factories and mills will be using the gas. Some contracts have already been made, and the pressure will be turned on just as soon as the necessary plumbing can be completed. The entire capacity of the present main is expected to be taken by the fall, when additional lines will be laid. The supply of gas in the fields is considered equal to all demands of the city, and the permanency of the supply can only be determined by time.

A corporation, under the title of the Pennsylvania Concentrating Company, is experimenting with the Edison magnetic separator in Washington Township, near Reading, Pa.

The Copper Situation.

What is a Fair Price for Copper?

The great question which the producers and holders of copper will be forced to decide at an early date—so far as the decision rests with them—will be at what price can they hope to inspire confidence among consumers and speculators. Under normal conditions the safe price would be that at which enough copper could be produced at an adequate profit to the mines throughout the world to supply its requirements. There are few commodities with which this price can be fixed with greater accuracy, because in nearly every great producing district of the world, Chili alone excepted, there are public companies whose published annual reports allow of a close approximation to the cost of production. Under ordinary conditions the normal price thus arrived at, approximately, if borne out by a study of the history of the trade during the depression, would represent the figure below which purchases would be safe, providing consumption came up to a fair average. But the present conditions are extraordinary because there has been an accumulation of stock held by parties of whom at least some will be anxious to part with their unusual holdings as soon as they can do it without too great a loss. The amount of the advances made is the most potent factor determining the figure at or near which this copper will be pressed on the market.

All interests point in one direction—the establishment of a low price. If the great mining companies in the world, nearly all of them having been members of the French pool, agree to restrict production, which has its difficulties, and at the same time make the mistake of placing their price too high, they will render a great part of their sacrifice nugatory, because the smaller scattered concerns will not alone continue, but will extend, their operations. They will be the ones to reap the benefit. The leading mines will continue to suffer from the hostile attitude of consumers, and will constantly be tormented by speculators. Safety lies in not alone going right down to that price at which only the best mines can produce with moderate profit, but to cut below it. Any effort to hold above that figure must lead to embarrassment and final discomfiture. The reduction of the output will represent that quantity which the mines are willing and able to let the holders of the stock place on the market.

Turning first to the United States, we may state at the outset that our home consumption, putting it as high even as 130,000,000 pounds, could be covered very easily, without real hardship to the leading mines, at 10½ cents for lake and 10 cents for other brands. At 10½ cents the Calumet and Hecla, the Tamarack, Quincy, Osceola, Atlantic, Central and Franklin mines could live, they representing a total product of about 80,000,000 pounds. At 10 cents for other brands, in Montana the Anaconda, Boston and Montana, Parrott and the mines working chiefly on argentiferous ore could run to full capacity and pay relatively small dividends. They would represent an output of least 90,000,000 pounds. Among the Arizona mines the Copper Queen, Holbrook and Cave, Detroit and Old Dominion could stand up under 10-cent copper and supply the markets with 20,000,000 pounds at least. Add that part of the product of Colorado which is derived from argentiferous ores, and the copper coming from the lead smelters and desilverizers, say 3,000,

000 pounds, and a grand total is reached of 193,000,000 pounds of copper, which could be marketed with present facilities at 10 and 10½ cents respectively, without any loss whatever to the weakest of the mines participating in the product, and with a very good profit to the best-equipped and richest of them. These are not rough guesses, but are based, in the majority of cases, upon actual cost of production. Placing the consumption of the country at 180,000,000 pounds, which is very liberal, we would have available for export 63,000,000 pounds annually, which could be laid down in Liverpool at less than £50 for best tough cake, or, say, £45 for Chili bars, the quantity being, say, 28,000 tons. It is probable, however, that there would be far less pressure to produce than there was during the bonanza year of 1888, and the export would in all likelihood not be more than 20,000 gross tons.

In Europe we must look to the year 1886 to judge of the capacity of the copper companies to meet low prices. In Spain and Portugal, in that year, Rio Tinto dividends went down to 3 per cent. and Tharsis to 7½, while Mason & Barry distributed nothing. The average price of Chili bars during that year was slightly over £40, so that at £45 the three concerns could produce at a moderate profit at the rate of about 50,000 tons per annum, not counting any of the other Spanish mines.

In Germany the Mansfeld Company, with a product of about 13,000 tons, was hard pressed when the price fell to £40, but would certainly continue at £45. Chili fell off rapidly at low prices, but might be expected to supply at least 25,000 tons. The Cape makes good dividends at the lowest prices, and could ship 7500 tons. Australia is weak, and, judging from the Wallaroo and Moonta reports, could not supply more than 7000 tons at £45. Japan has gone right along at a 10,000-ton rate in bad times. Venezuela lost money in former years, but has improved its practice after American models, and might furnish 3000 tons. The Boleo mines, in Mexico, may be credited with 2500 tons; Canada with 2000 tons, of which the bulk comes to this country in the form of pyrites, and Newfoundland may be put down at 1000 tons. Then there are a number of sources of supply, partly local, like the Russian, which would aggregate about 12,000 tons. Summarizing, we have:

	1888.	1886.	At £45 C. B.
United States.....	100,667	69,971	86,000
Spain and Portugal.....	63,800	49,653	50,000
Mansfeld.....	13,380	12,595	13,000
Chili.....	31,240	35,025	25,000
Cape.....	7,500	6,015	7,500
Australia.....	7,450	9,700	7,000
Japan.....	11,000	12,000	10,000
Venezuela.....	4,000	3,708	3,000
Mexico.....	2,766	250	2,500
Canada.....	2,250	1,440	2,000
Newfoundland.....	2,050	1,125	1,000
All others.....	13,288	18,620	12,000
Total.....	260,058	220,102	219,000

It is evident, then, that with copper ruling in London on the basis of £45 for Chili bars, or its equivalent here of about 10½ cents for lake, enough metal can be produced without loss to the mining companies to supply the world with about as much metal as it received in 1886. In that year, with the price averaging £40½ in London, and the lake companies' sales for the year ranging between 10½ and nearly 11 cents as the average, the stock in England and France increased 58,170 tons on January 1 to 63,290 tons on the 31st of December. Assuming that the mines likely to aid the copper holders, with an annual product of 180,000 tons, are willing to cut down production 20 per cent., equal to 36,000 tons, the relief would be inadequate. It is estimated by James Lewis & Son, of Liverpool, high authorities, that the total stock is now 175,000 tons. Even granting that

100,000 tons be regarded as a quantity which the trade might carry fairly well, if widely distributed, we have 75,000 tons which must be pushed into consumption in two years. Even putting the matter in its most favorable light, that low prices would stimulate the consumption, say to the extent of 20,000 tons, even then over a year of restricted output would have to continue before the stock became manageable, and that always assuming that the basis be fixed as low as £45.

Ten-cent copper may seem startling to the mining companies, but unless they apply the heroic treatment indicated, and perform the part at the same time of dwelling in harmony together for a year of curtailed output all over the world, the present agony will be prolonged for years. We believe that the situation warrants the conclusion that no buyer, whether it be of the crude metal or of manufactured goods, is entitled to feel safe over his purchase if it was made above the basis of 10½ cents for lake or £45 for Chili bars.

Can the Mines Agree to Reduce Output?

These views are strengthened by further considerations. It is not an easy matter for some of the mines, notably in the Spanish Peninsula, to restrict production, even if they earnestly desire it. With all of the American copper producers, the copper in the ore is extracted in a relatively short time after it has been hoisted. In the great Lake mines the rock is crushed under stamps and then washed, the product being metallic copper, carrying 75 to 88 per cent., the so-called "mineral" which is refined. The Arizona mines produce almost exclusively carbonate and oxidized ores, which need only smelting in cupola furnaces to yield the black copper, running from 95 to 97 per cent. The Montana mines turn out sulphuret ores, which are first put through concentrators, are then roasted and smelted in reverberatory furnaces, the product being matte, running from 55 to 65 per cent. of copper. The exception is the Parrott, which converts its matte into blister copper, running as high as 99 per cent., by the Manhès-Bessemer process. In two weeks, at the utmost, the ore is converted into a high-grade shipping product from the time it reached the mouth of the shaft. Under these circumstances a total suspension of work for a brief period, or a slackening by employing only a part of the plant, is a matter easily arranged.

Now, let us study the methods in vogue in Spain and Portugal. The ore is an iron pyrites carrying a small percentage of copper, say 3 per cent. A considerable part of the raw ore raised is exported as such, being sold in England and on the Continent for the manufacture of sulphuric acid. It is then, after the expulsion of the sulphur, treated in special metal extraction works for the recovery of the copper, silver and gold it contains. The quantity of pyrites thus used is dependent upon the demand for sulphuric acid, and indirectly upon the consumption of Leblanc soda, in the manufacture of which the greatest part of the sulphuric acid is used. Whatever the Spanish companies may agree to do they cannot and will not interfere with that part of their product which is marketed in this way. The quantities are considerable. Thus the three leading pyrites miners shipped in 1887:

	Pyrites for shipment.	For local extraction of copper.
Rio Tinto.....	362,796	819,642
Tharsis.....	282,653	352,562
Mason & Barry.....	80,838	248,290

In England alone the quantity of copper produced from burnt pyrites, after their use in sulphuric acid works, ranges be-

tween 14,000 and 15,000 gross tons annually.

Let us turn now to the methods of extraction at the mines to which the larger percentage of the output is subjected. The old method and that still largely used consists of forming large piles of the raw ore containing many thousands of tons. These are fired to expel a great part of the sulphur, by roasting, a process which takes months. Then water is run over the roasted ore, leaching out the copper, which is precipitated from the liquor by scrap iron. Now, while the greater part of the copper contents is taken out in a relatively short time, very important quantities are obtained from the old heaps year after year. The leading mines have millions of tons of these old heaps weathering, from which certain amounts of copper are derived. A reduction of output could only be effected by abstaining from starting new heaps burning. Naturally the effect of such a policy would only tell months after it had begun, but it would, if continued for some time, have its effect upon the yield of the mines for years to come. Where the other mines throughout the world suffer only temporarily from a reduced output, the Spanish mines must face the fact that a sacrifice made now will be felt for years to come.

Another circumstance deserves serious consideration with them. The enormous quantities of water required in an arid region in past years were the most important factor in determining production. Then the quantity of rainfall measured pretty accurately the output of precipitate copper, and prices felt the effect of a drought near Huelva, Spain. To the mining companies water was precious, and in order to render themselves as independent as possible of the fluctuations in the supply, enormous works, in the way of storage dams, were created at a great outlay. All this cost money, and the principal mines have very large amounts of fixed charges in the way of interest on bonds which, distributed over a smaller product, run its cost up materially. Relatively speaking, the amount of capital actually invested in the Spanish mines is much greater than it is with any large copper undertakings in any other part of the world.

The policy of the Spanish mines and of the Rio Tinto, the largest, in particular, has been to distribute these fixed charges over as large a tonnage as possible. Now they are asked to abandon what is their true line of action, and embark in a system from which they more than any other producer must suffer most.

It is just, however, to call attention to one point, and that is, that so far as the Rio Tinto Company are concerned the hampering effect of the slow extraction under the old methods has less weight. For some years the company have been gradually abandoning the old method of roasting and leaching, and have adopted the Doetsch process. It would take us too far to enter into technical details; suffice it to say that the tedious roasting process is entirely suppressed, the raw ore being treated directly. This means quicker work, less quantities of partly treated ore, and lower working capital. Besides, the leading spirits in the Rio Tinto are the Mathesons, who are supposed to be favorable to the scheme for the relief of the copper holders. But the other companies are less likely to let such considerations override broader questions of policy, and we doubt whether their assent will be as readily obtained and are inclined to believe that if they do join they will prove restive members.

Will the Weak Mines Stop?

It is generally assumed that with a lowering of the price of copper the small

mines in this country and in other parts of the world will stop work. There can be little doubt that from the standpoint of the stockholders that would be the wisest policy. Unfortunately past experience has pretty clearly shown that such a step is only taken in very rare instances. Usually those in control of the management lure their associates along by promises and hopes. It is probably a fact that in the majority of cases superintendents and managing directors are honestly sanguine. In a few instances the desire to secure their own salaries outweighs any considerations from the point of view of the best interests of stockholders. We may divide the weak mines into two groups: Old decrepit concerns galvanized into life by the hope of profit while the copper corner lasted, and new enterprises called into being by the high prices. The former are not likely to survive a drop in values very long. The latter will prove more tenacious of life. A good many of them have made enough money on a small output to pay for considerable improvements. Their constituents have not been bled to exhaustion, and can be relied upon to supply considerable funds before they conclude that it is better not to throw good money after bad. Individually these concerns do not amount to much, but in the aggregate they will furnish considerable metal even when the prices are low. Then there are the concerns which were lingering on the verge of bankruptcy when the syndicate began its famous operations. They have been making considerable money during 1888, and may have strengthened their position by making improvements in plant and equipment and bettering their finances, which will actually enable them to meet low prices without serious loss. They will certainly show readiness to test their capacity to bear the burdens of a low market before they are forced to succumb.

Considerations like these are not likely to weigh seriously with the great corporations, but in spite of that their influence will be quite keenly felt. The tendency of the leading mines will be to place the price limit higher than the condition of their smaller competitors warrants. Consumers and the trade generally will not be misled by their earnest protestations. They may be made in good faith, but we repeat that it will not be safe on the long run to contract on anything above the basis of 10 to 10½ cents for lake copper. The great concerns which can live at that price will act wisely if they thrust in the knife to that extent.

The annual report of the New York local inspectors of steam vessels, soon to be handed in to the Treasury Department, will show that the total number of steam vessels licensed in the United States during the year 1888 was 6425, with an aggregate tonnage of 1,235,134.62. Of the total number New York was represented by 972 steamers, with an aggregate tonnage of 216,148.42. The total number of masters licensed was 7931; in New York, 1223; total mates, 1692; in New York, 107; total pilots, 6586; in New York, 1021; total engineers, 13,422; in New York, 2176. There were 56,000,000 people carried during the year, and 40,300,000 traveled on the New York boats. The total loss of life in the United States was 202, and only 12 deaths occurred on the New York boats. Of these eight were drowned. There were found 254 defective boilers in New York and nine were condemned. During the year two masters, nine mates, 36 pilots and 96 engineers were refused licenses. There were 191 reports of accidents made to the office of the local inspectors, and 161 of these were of collisions from which no loss of life resulted. In all 114 investigations were made, of which 57 were in

New York. Two licenses were revoked, two decisions were sustained on appeal and one is yet pending.

We have the authority of Abram S. Hewitt himself for the statement that there is no truth whatever in the reports that any of the works in which Cooper, Hewitt & Co. are interested are to be moved to the South, or that Mr. Hewitt has purchased any interest in the Tennessee Coal, Iron and Railroad Company, or in any other Southern iron enterprise in which he was not already interested previous to the trip from what he has just returned. Messrs. Hewitt, Cooper and Fackenthal visited the South with the object of personally studying the situation. We understand that a good many data were collected notably on the point what relation railroad freights bear to the iron industry of the South as compared with the cost of hauling raw materials and products in the North. We are informed that these figures will form the basis of a letter to be written to four leading railroad companies serving the iron districts of Eastern Pennsylvania and New Jersey. The protest if unheeded will throw upon the managers of the railroad companies the responsibility for whatever consequences may grow out of the continuance of the present policy of freight rates.

A meeting of the creditors of the Reading Iron Works was held in Philadelphia on the 21st inst. At the first meeting it was announced that for the past four years the iron works had made \$600,000. This was on the face a good showing, but an examination of the books for the period stated showed the result to be entirely different. It was found that in 1885 the works were operated at a loss of \$26,000. In 1886 a profit of \$180,000 was charged to the credit account, while in 1887 there was a profit of \$22,000, and in 1888 a loss of \$389,000, so that instead of having made \$600,000 in the four years mentioned the loss has been \$263,000. It appeared also by the report of the Committee on Appraisal that there has been a shrinkage of nearly \$500,000 in the book accounts, and that instead of having \$870,000 of stock and material, there is only \$380,000 worth. A number of the largest creditors have refused to sign the plan of reorganization, and seem disposed to co-operate with those who have applied for a receiver.

Mr. Jos. Gest, of the South Side, Pittsburgh, has recently invented and patented a method of rolling iron and steel rails into merchant bar iron, structural iron, &c., which has been put into successful operation in Pittsburgh by Lean & Blair, the well-known contractors and engineers of that city, and is about to be put into operation also at the Tidewater Steel Works, at Chester, Pa., by them and their associates, who have organized under the title of the Structural Steel and Iron Company. It is claimed that this method of rolling will do the same work in three passes that under the ordinary processes requires 11 and 12 passes. The rolls are now being turned and the necessary alterations are being made in the mill to start this new plant on several large orders of car bars. The main office of the company will be in Messrs. Lean & Blair's rooms in the Penn Building, Pittsburgh, and their Eastern agents are the well-known firm of J. B. Wilson & Co., Limited, whose offices are in the Drexel Building, Philadelphia.

The Louisville and Nashville Railroad have just let out contracts to the Missouri Car and Foundry Company for the construction of 500 box cars, and to the Indianapolis Car and Mfg. Company for 500 fruit cars.

TRADE REPORT.

Chicago.

Office of *The Iron Age*, 95 and 97 Washington street, CHICAGO, March 25, 1889.

Pig Iron.—The country trade was the main reliance of the market last week, taking quite a considerable quantity of Coke Iron for forward delivery. As this business was secured principally by local furnaces the dealers handling outside Iron found business very quiet. The policy of the consolidated Steel companies with respect to Pig Iron has been announced, and, as intimated last week, they propose to run some of their furnaces on Foundry, Mill and Bessemer Irons for the general market. This will insure a local supply of ample proportions as long as the Steel Rail trade is dull or until other finished products will be turned out in such quantities as to absorb their entire furnace capacity. Prices have not advanced, and there appears to be no reason to expect an advance in the near future; but, on the other hand, no evidence of further weakening has transpired, so that the market can be called fairly steady. Lake Superior Charcoal is quiet and without change. Cash quotations are as follows, f.o.b. Chicago: Lake Superior Coke, No. 1, \$16 @ \$16.50; No. 2, \$15 @ \$15.50; No. 3, \$14 @ \$14.50; Chicago Scotch, No. 1, \$17.50, for small quantities; Lake Superior Charcoal, all numbers, \$19.50; American Scotch (Blackband), No. 1, \$18 @ \$19; Jackson County Silvery, No. 1, \$18 @ \$18.25; other Ohio Soft Irons, No. 1, \$17.25 @ \$17.50; Southern Coke, No. 1 Foundry, \$16.25 @ \$16.75; No. 2 Foundry and No. 1 Soft, \$15.75 @ \$16; No. 3 Foundry, \$15 @ \$15.50; Gray Forge and No. 2 Soft, \$14.50 @ \$14.75; Tennessee Charcoal, No. 1, \$19.

Bar Iron.—Orders are a little more plentiful, particularly from manufacturers of agricultural implements, wagon makers, and others depending upon the patronage of the farming community. The demand for small lots is much stronger, and jobbers are at length doing a fairly satisfactory business. At the same time, the Iron manufacturers are reported to be much firmer in their views, and buyers are looking with some interest for the "cheap" mills. The firmer feeling is hardly caused by heavier business, but probably arises from the close scrutiny of cost sheets. With raw material and wages at the rates now existing there was certainly no margin of profit but very likely a loss on the low prices recently made. Representatives of Valley mills quote 1.50¢, half extras, at mill, and insist that this is a firm rate, fixed by agreement among them. Mills located nearer to this market have an advantage, of course, in quoting on the same basis, so that prices for mill lots of Good Common Iron now range from 1.80¢ to 1.65¢, half extras, f.o.b. Chicago. Store prices are unchanged at 1.80¢ @ 2¢, according to quantity and quality.

Structural Iron.—Contracts were placed during the week for the erection of several good-sized buildings, and orders for Beams are consequently larger than they have been at any previous time this spring. In other lines business is quite light. An order for 300 tons of Angles and Heavy Sheets, cut to pattern, was placed at a very low figure. On ordinary lots quotations by the mills are unchanged.

Plates, Tubes, &c.—A repetition of the heavy business of the previous week was hardly to be expected, yet orders for considerable quantities of Plates were taken. Work which has been in prospect for some time is now taking definite

shape and realizing the hopeful predictions of members of the trade. Tubes are firmer in consequence of the recent action of the manufacturers, but quotations are no higher, as extra concessions have merely been cut off. Mills are trying to advance their figures on Plates about \$1 ¢ ton, but enough of them are to be found taking old prices to keep quotations as they have been.

Sheet Iron.—Jobbers are still endeavoring to place orders with the mills for summer and fall delivery, but are making slow progress for reasons stated in previous reports. Prices on large lots for early delivery hover around 2.90¢ for No. 27 Common, f.o.b. Chicago. Small lots of No. 27 sell at 3.10¢ @ 3.20¢ from store, with but little doing.

Galvanized Iron.—The heavy demand reported by manufacturers' agents last week did not keep up its pace, but slackened down considerably. Nevertheless, a fair business was transacted, and the result for the month will undoubtedly be excellent. Small lots continue to be quoted at 65 ¢ off for Juniata, and 65 and 2 1/2 ¢ off for Charcoal.

Merchant Steel.—Business in this branch continues to improve. The demand from store is growing, and the manufacturers of agricultural implements are buying to some extent. Syndicate Steel is in request by plow manufacturers who appear to be running out of stock in consequence of their trade exceeding their estimates. Quotations are unchanged.

Steel Rails.—Notices have been issued for meetings of the stockholders of the North Chicago Rolling Mill Company and the Union Steel Company, to be held in this city on May 1. The notices embody in them the propositions with regard to consolidation which were set forth in the last issue of *The Iron Age*. The stockholders of the North Chicago Rolling Mill Company will vote upon a proposed increase of stock from \$6,000,000 to \$25,000,000, a change of name to the Illinois Steel Company, an increase of the number of directors from 3 to 11, &c. Proxies have already been received representing a large amount of stock, and are all to be cast in favor of the scheme. The demand for Rails has been light during the week, but prices are maintained at \$30 @ \$30.50.

Old Rails and Wheels.—Offerings of Old Iron Rails are limited, and holders assert their ability to secure \$21.25 @ \$21.50, but the demand is by no means urgent. Local consumers insist that they will not pay over \$20 @ \$20.50. Inquiries are in the market for Old Car - Wheels, but buyers and sellers are apart in their views as to the value of lots of any size. Some carload lots have been sold by Scrap dealers at \$18.25, and buyers insist that large lots should sell at a lower rate, while sellers ask \$18.50 @ \$19.

Scrap.—Lively "drumming" is necessary now to effect sales. Consumers are apathetic and buy only for immediate wants and in small quantities. In this way some business has been transacted during the week in No. 1 Forge, Mill Scrap, Mixed Steel, &c., but the aggregate was not large. Dealers are now paying \$13 for Mixed Country Scrap. Carefully Selected is quoted to consumers as follows, ¢ ton of 2000 lb: No. 1 Forge or Railroad Shop, \$19 @ \$19.50; Track, \$19; Fish Plates, \$20 @ \$21; Axles, \$24; Horseshoes, \$18.50; No. 1 Mill, \$14; Pipes and Tubes, \$13 @ \$14; Light Iron, \$9; Cast Machinery, \$13; Stove Plate, \$10; Cast Borings, \$8.50; Wrought Turnings, \$11.50; Axle Turnings, \$13 @ \$14; Mixed Steel, \$11.50; Coil and Leaf Steel, \$14; Tires, \$15 @ \$16.

General Hardware.—Jobbers of both Shelf and Heavy Hardware report their

business steadily gaining from day to day. Some Shelf Hardware houses have been obliged to keep their packers at work late at night during the past week to catch up to current business. No change of any consequence is reported in prices.

Nails.—Cut Nails are selling very slowly from factory, but plenty of orders for Wire Nails are being booked by manufacturers' agents. This peculiar condition of affairs is hardly to be taken as an indication that the Wire Nail has supplanted the Cut Nail more than ever, as in certain lines of trade a reaction has set in against the former. The cause of the greater activity in Wire Nails is plainly the strong demand from jobbers who did not stock up when the price was very low, believing that a still lower point might be touched. Now that the price has been forced up slightly they are placing their orders. The Cut-Nail manufacturers, however, appear to be still filling the contracts they made at low figures last fall. This comparatively better condition of Wire Nails is described by a well-posted member of the trade as an accident rather than a piece of good management. The manufacturers would have filled their order-books at low prices just as the Cut-Nail manufacturers did if they could have induced the trade to buy at that time. The Muncie Nail Company, of Muncie, Ind., successors to the Greencastle Iron and Nail Company, started their factory last week. Jobbers report a very good demand now ruling for both kinds of Nails, but they have made no change in prices as yet. Steel Nails are selling at \$2 for small lots and \$1.95 for carload lots; Wire Nails, \$2.40 for small lots and \$2.35 for carload lots.

Barb Wire.—Stocks have been run off very rapidly of late. Manufacturers' warehouses are about empty, and orders now coming in take their production as it comes from the machines. Heavy orders have been refused at rates which would have easily passed from two to three weeks since. Decided firmness has been imparted to the whole trade. Jobbers are instructing their salesmen not to sell below 2.80¢ for Painted, and manifest an indisposition to name any lower price for carload lots. Galvanized maintains the usual advance of 60¢ @ 65¢ ¢ 100 lb over Painted.

Pig Lead.—Prices for carload lots declined in this market to 3.45¢ last week, with sales of about 200 tons. It is intimated that the stocks held by New York banks are likely to pass into stronger hands, with favorable effects on prices.

A joint sales agency has been established at Chicago by the Trumbull Iron Company, the Falcon Iron and Nail Company and the Salem Wire Nail Company under the management of E. C. Brainard, an accomplished salesman of long experience, whose office is located in the Phenix Building.

James Johnston, agent for the Springfield Iron Company, has removed his office from 115 Dearborn street to the Phenix Building.

Rogers, Brown & Co., Rookery Building, Chicago, announce that they have secured the sale agency of the Mayville brand of Pig Iron manufactured by the Northwestern Iron Company. They have also added to their list of Southern brands the Trussville, made by the new furnace just completed by Pennsylvania capitalists at Trussville, near Birmingham, Ala.

Pickands, Brown & Co., dealers in Pig Iron, Iron Ore, &c., will remove some time in April from their present location at 115 Dearborn street, Chicago, to the Rookery Building, corner La Salle and Adams streets. They will add to their other business the sales agency for Pig Iron and Spiegeleisen manufactured by the con-

solidated Steel companies. It is the purpose of these companies to turn their attention largely to the manufacture of Foundry, Mill and Bessemer Pig Iron to supply the Chicago district. In entering the general Pig-Iron trade it was deemed advisable to use an established commission house, with its regularly organized channels of distribution and its close relations with consumers, rather than to attempt to make direct sales. The long experience in the Pig-Iron trade of the members of the firm of Pickands, Brown & Co. will also be of great value to the Steel companies in determining upon the exact qualities and characteristics of their Iron to meet the demands of general consumers.

Pittsburgh.

Office of *The Iron Age*, 77 Fourth Ave.,
PITTSBURGH, March 26, 1889.

There has been no perceptible improvement in the general Iron business in this district during the past week; dullness is still the order of the day. Just as soon as buyers can be convinced that hard-pan has been reached orders for all kinds of Finished Iron will commence to come forward freely and they in turn will stimulate the demand for the raw article. It is pretty confidently expected that there will be a general improvement in the situation within the next week or two. The reports from the West and South are generally of an encouraging character, and we look for a good demand from these sections, not only for Iron and Steel, but all kinds of manufactured goods. There is no branch of business more overdone here than that of Iron brokerage; Iron brokers have more than trebled within the past few years, and brokerages, like everything else, are down very low as compared with what they were years ago. Some of the brokers are offering to sell for a commission of from 15¢ to 25¢ per ton, and some of the city furnaces are disposed as much as possible to shut the brokers out and sell direct to consumers. It is asserted by some, who are disposed to be sarcastic at the expense of the brokers, that whenever a man fails in other branches of business, as a last resort he enters the iron brokerage business. Some of the best men in the iron business are brokers; they study it up close and are hard workers, and these, as might be expected, are the ones who succeed. Mr. H. P. Smith, general manager of the Allegheny Bessemer Company, whose works are located at Duquesne, about 10 miles from this city, on the Monongahela River and on the line of the Pittsburgh, Virginia and Charleston Railroad, who has been absent in the South for his health since last November, has returned home and resumed his duties. The Rail mill of this company has been started. The management claim that they are able to compete with any mill in the country, having all of the latest appliances and improvements. The Allegheny Bessemer are a strictly Pittsburgh company; included in their active managers are W. G. Park, of the Black Diamond Steel Works, and Edward Clark, of the Solar Iron Works.

Pig Iron.—There is no improvement to note, but it is hoped and expected that there soon will be. Consumers are buying only as their immediate necessities require, and it is not likely that they will do otherwise as long as the market continues in its present unsatisfactory and depressed condition. Mill owners generally report a very light demand for Finished Iron, and while this is the case there is not likely to be much improvement in the demand for the raw article. However, there is not much offering. Our city furnaces are well sold up, and Shenango and Mahoning valley furnaces are not very anxious to sell in this market at present prices. It may

be noted in this connection that furnace-men frequently and unintentionally depress the market by placing their product in the hands of several brokers, who are all offering it for sale at the same time, and thereby making the offerings appear much larger than what they really are. There has been no quotable change in prices during the past week, with the exception of Bessemer, which is a shade lower. We quote prices as follows:

Neutral Gray Forge.....	\$14.50 @	.....	cash
All Ore Mill.....	15.00 @	15.50	"
White and Mottled.....	13.50 @	14.00	"
No. 1 Foundry.....	16.00 @	16.50	"
No. 2 Foundry.....	15.00 @	15.50	"
No. 1 Charcoal Foundry.....	23.00 @	24.00	"
No. 2 Charcoal Foundry.....	21.50 @	22.00	"
Cold Blast Charcoal.....	25.00 @	26.00	"
Bessemer Iron.....	16.50 @	16.75	"

Muck Bar.—There is no improvement in demand, and, while the market continues dull, prices remain nominally unchanged at \$26.50 @ \$27, cash. It is said that Muck made from Southern Pig is being offered here pretty freely, but that it is difficult to get consumers to take hold of it—it appears that they would rather pay more for the home-made article. The trouble with this Southern Muck is that it is unknown here, as but very little of it has as yet been used in this market.

Manufactured Iron.—There has been no improvement in the demand since our last report; but very few of the mills are busy, and prices continue unsettled and unremunerative. As intimated elsewhere, however, there is reason to look for a considerably improved demand just as soon as buyers can be convinced that prices have reached the lowest point; it is not to be expected that large buyers will anticipate future wants as long as there is a possibility of lower prices. We continue to quote Bars at 1.65¢ @ 1.75¢, and Skelp Iron at 1.65¢ for Grooved and 1.90¢ @ 1.95¢ for Sheared. As the Pipe trade is about to open up, an increased demand for Skelp Iron is looked for within the next few weeks.

Nails.—There is no improvement in the Nail trade. Full card rates are still demanded, and we continue to quote upon a basis of \$1.90 for 12d to 40d, 60 days, 2 % off for cash.

Wrought-Iron Pipe.—The meeting of the Wrought-Iron Pipe manufacturers last week was largely attended, nearly every mill in the country having been represented, and the proceedings were, as we learn, harmonious. This was the first meeting since last summer, and since early last fall the market has been an open one, each firm being clear to make its own price. As a consequence, the market has been in an exceedingly unsettled and unsatisfactory condition; prices were cut to such an extent that orders were taken at cost and even below cost. A price list was adopted as follows: Discounts on Black Butt-Welded Pipe, 55 and 5 %; on Galvanized do., 47½ and 5 %; on Black Lap-Welded, 67½ and 5 %; on Galvanized do., 55 and 5 %; 2-inch Tubing, 13¢ per foot, net; 5½-inch Casing, 62½ % off; Boiler Tubes, 62½ % off regular list.

Old Rails.—There is some inquiry for Old Iron Rails, and we are advised of a couple of sales—400 tons at \$23 and 500 tons at \$23.50. It is claimed by brokers that there are but few sellers at inside quotation. Old Steel Rails are quoted at \$17.50 @ \$18 for short and \$19 @ \$20 for long lengths, with an increasing demand.

Steel Rails.—Mill owners here are in favor of co-operation in regard to prices, provided it is adhered to in good faith. Large shipments are being made South and West on contracts made some time ago.

Blooms, Billets, &c.—Bessemer Steel Billets and Blooms are quoted at \$27 @ \$27.50, cash, at maker's mill. We hear of

a sale of 12,000 tons to be delivered at the rate of 2000 tons a month, but the price was not stated. There appears to be no demand for Nail Slabs; sale of 2000 tons Domestic Bloom Ends at \$18, cash. There has been considerable inquiry for these of late.

Railway Track Supplies.—There has been no recent change in prices. Spikes, 2¢, 80 days, f. o. b., at works. Splice Bars, 1.70 @ 1.75¢ and Track Bolts 2.75¢ with Square and 2.85¢ with Hexagon Nuts.

Old Material.—Demand continues light and prices weak, but without quotable change. No. 1 Wrought, \$19 @ \$19.50, per net ton; Wrought Turnings, \$13 @ \$13.50; Car Axles, \$24.50 @ \$25; Cast Scrap, \$14.50 @ \$15, gross ton; Old Car-Wheels, \$19 @ \$19.50.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St.,
PHILADELPHIA, Pa., March 26, 1889.

Pig Iron.—There is very little change to report in Pig Iron, although the general position of the trade shows improvement as compared with last week. It is true that the decline in Finished Iron was greater in proportion than that in the raw material, so that it is perhaps only natural that the reaction should commence at the weakest point. As regards Pig Iron, there is a fairly good demand and prices are steady, but at the moment there is nothing to indicate very much change in the near future. Bottom prices are believed to have been reached some time ago, but there are too many sellers to permit of any advance being demanded at present. A good deal depends, however, upon the condition of the Western and Southern markets. Apart from their competition, it would be perfectly safe to predict a better market, but so long as there is a possibility of having to take their surplus prices are not likely to be advanced so as to invite such a contingency. At present the offerings are not urgent from these sources, although some sales of Alabama Irons are being made at \$15.25 for Gray Forge and \$17 @ 17.50 for No. 1 Foundry, delivered in consumers' yards. These are largely of sample lots, although in one case 1000 tons of Forge were taken at \$15.25, delivered. The main object appears to be to introduce the Iron, after which price will depend upon circumstances. But it is pretty well understood that prices of local Irons will have to be kept at a low point, otherwise this will always be more or less of a dumping ground. Many improvements have been introduced at near-by furnaces, however, and although freights and fuel are altogether too high, there is no doubt that the leading companies are making Iron much cheaper than formerly, although the impression is that current rates are about as low as makers of Pig Iron will be called upon to meet during the present period of depression. Something might be said in regard to the possibility of an advance, but as these points were touched upon last week it is unnecessary to refer to them again, although they are still worthy of consideration. Suffice it to say that sales during the week have been on a moderately liberal scale, with the following as the usual asking prices for tidewater deliveries: No. 1 Foundry, \$18; No. 2 do., \$16.50 @ \$17, and Gray Forge, \$15.25 @ \$15.50. Foundry Irons may have been shaded a trifle on some brands, but for strictly good qualities prices have been held very steady, while the number of inquiries points to a very good demand in the near future.

Blooms.—There is no special change to notice as regards prices, but the volume of business is steadily increasing. Quota-

tions depend very much upon requirements as to analysis, &c., but in ordinary cases the following fairly represent the market: \$28 @ \$28.50, at mill, for Nail Slabs; \$29 @ \$30 for Sheet-Iron Billets; \$30 @ \$31 for Soft Tank, and \$35 @ \$36 for Flange purposes; Charcoal Blooms, \$52 @ \$54; Run-out Anthracite, \$41 @ \$42.50; Scrap Blooms, \$32 @ \$33 7/8 "Bloom" ton of 2464 lb.

Muck Bars.—There is a little more disposition to buy, but bids are still low, and only small lots are taken at the asking prices, which are about \$27, delivered, for good qualities. Some hold for \$27.50, but, on the other hand, bids of \$26.50 have been accepted for 1000-ton lots for what sellers claim to be strictly good Bars. On the whole, the feeling is better, and \$27 seems to be a fair quotation to-day.

Bar Iron.—There is more business around, and sellers claim to be firmer than they were a few days ago. There is undoubtedly more business offering, and the outlook is better, but it is questionable if prices are any higher. There are too many mills wanting business to permit that, although some parties who intimated that they might accept certain very low prices on firm offer did not feel so inclined when the bids were made. To that extent, therefore, there is some improvement, and it appears likely enough that additional hardening will be met with in course of the next two or three weeks. Prices have been much too low, and the cutting in extras has been so general that the low quotations failed to show the serious position into which the trade had fallen. There is reason to believe that matters are improving, however, and while uniformity in prices can hardly be expected in times like these, the feeling is that the lowest prices have been passed and more or less improvement may be looked for in the immediate future. Car building is picking up again, and the general demand is also larger than it has been. Nominal prices are from 1.75¢ to 1.85¢, but there is not as much business done at the outside figure as there is at the lower one, while even that has been shaded on good-sized orders.

Plate and Tank Material.—A better demand is reported, although prices are still at the lowest point yet reached. Mills are beginning to accumulate orders, however, so that if the demand keeps up, as seems probable, a little stiffening may be looked for before long. A good deal of talk is indulged in in regard to the large amount of business near at hand; and while it cannot all be verified, there is no doubt something in it. Consumers are all pretty well employed, and the recent orders for bridge work, tank cars and elevated work can hardly fail to benefit local mills, although competition from the West is unusually close. Prices in the meantime remain as before, viz.: 1.90¢ @ 2¢ for Ordinary Plates and Tank Plates; 2.1¢ @ 2.2¢ for Universal Plates; Shell, 2.4¢ @ 2.5¢; Flange, 3.3¢ @ 3.4¢; Fire-Box, 3.5¢ @ 3.7¢; Steel Plates, Tank and Ship Plate, 2.1¢ @ 2.25¢; Shell, 2.7¢; Flange, 3¢ @ 3 1/4¢; Fire-Box, 3 1/4¢ @ 3 1/2¢.

Structural Material.—Important additions have been made to some of the order-books recently, although at this stage of the proceedings it is impossible to obtain particulars. Besides a liberal amount of bridge and ship orders, it is understood that from 8000 to 10,000 tons of elevated work is under negotiation, and if not actually closed, it is so near to it that there is very little room to doubt its final consummation. The outlook is therefore decidedly more hopeful than it was three or four weeks ago, and the chances appear now to be favorable for a very active summer's business. For the present prices remain about as follows:

Bridge Plate, 2¢ @ 2.1¢; Angles, 1.95¢ @ 2.05¢; Tees, 2.4¢ @ 2.6¢; Beams and Channels, 2.8¢ for Iron or Steel.

Sheet Iron.—The demand is a little dull, but prices are steady and are quoted as follows for carload lots of the best makes:

Best Refined, Nos. 14 to 20.....3¢
Best Refined, Nos. 21 to 24.....3.20¢
Best Refined, Nos. 25 to 26.....3.40¢
Best Refined, No. 27.....3.50¢
Best Refined, No. 28.....3.60¢
Common, 1/4¢ less than the above.

Best Soft Steel, Nos. 14 to 20.....3 1/4¢
Best Soft Steel, Nos. 21 to 24.....3 1/2¢
Best Soft Steel, Nos. 25 to 26.....3 3/4¢
Best Soft Steel, No. 27.....4¢
Best Bloom Sheets, 1/4¢ extra over the above prices.

Best Bloom, Galvanized, discount.....65 %
Common, discount.....67 1/2 %

Steel Rails.—There is no change to note from last week. Prices are firm at \$28, at mill, but orders for large lots come in rather slowly, although manufacturers express full confidence in the ultimate outcome. The demand for Blooms, Billets, &c., is remarkably active, and goes a long way to offset the dullness in Rails. On the whole, the tendency is toward improvement, although as yet the pace is not very rapid.

Old Rails.—The demand is hardly as brisk as it was some time ago, but the light stocks enable holders to maintain prices very fairly. Sales have been made at from \$24 to \$24.50 for T's, delivered at mills near by, but buyers are not bidding over \$24 to-day. Nothing doing in spot lots, prices nominally \$23.50 for shipments, or \$24 and upward for lots in store.

Scrap Iron.—Scarce and in good demand at quoted rates. The feeling is better and holders show a good deal of firmness on desirable qualities. Quotations are about \$20.50 @ \$21 for cargo lots; \$21 @ \$21.50 for carload lots, delivered, or for choice \$22; No. 2 do., \$14 @ \$15; Turnings, \$14 @ \$15; Old Steel Rails, \$18 @ \$19; Cast Scrap, \$15 @ \$16; do. Borings, \$9 @ \$10; Old Fish Plates, \$23 @ \$24; Old Car-Wheels, \$17 @ \$18, Philadelphia.

Wrought Iron-Pipe.—There is a decided improvement both in demand and price, and while no change in discounts is quoted, sellers have from 5 % to 10 % in their favor, as compared with selling prices two or three weeks ago. Discounts are now firm as follows: Butt-Welded Black, 55 %; Lap-Welded Black, 65 %; Butt-Welded Galvanized, 45 %; Lap-Welded Galvanized, 55 %; Boiler Tubes, 62 1/2 %.

Nails.—There is very little change to notice, although the demand is a little more active. But prices are unsettled, with \$1.95 @ \$2 as the usual quotation for small lots from store.

Chattanooga.

Office of *The Iron Age*, Carter and 9th Sts.,
CHATTANOOGA, March 25, 1889.

Pig Iron.—The market, so far as prices are concerned, appears to be about at a standstill, although there are large amounts of Iron moving, and some of the furnaces are not able to ship their orders promptly, from the fact that they have taken more than they can do. There seems to be an indisposition on the part of the producers at the present time to book large orders for far-off deliveries. They do not think that prices will go any lower, and should there be an advance they propose to be in a condition to reap the benefit of it. As long as they can sell their output right along and keep their yards quite cleared up on current orders, which most of them appear to be now doing, it would be poor policy to sell at present low prices. So far as speculation is concerned, very little is now being done apparently. Many of the stacks have received offers to

advance them money on storage warrants, but so far as can be ascertained very little, if anything, has yet been done in that line, the producers preferring to dispose of their output and realize on it at once.

Miscellaneous.—The movements to establish new manufacturing centers and manufacturing enterprises seem to be more widespread than ever. The interest taken by many Northern capitalists has never been so great as it is now, and several new towns have been recently laid out, and as a general thing the movers in these enterprises have an abundance of money to back them in carrying them out successfully. From all indications it would appear that the South is receiving a much greater impetus on the road to prosperity than at any time in the past.

Louisville.

LOUISVILLE, KY., March 25, 1889.

Pig Iron.—There has been a fair demand for Iron during the past week. Prices are firm for standard brands and show a light increase. A number of Irons, however, are being offered at the same prices that have prevailed for some time, but strong Mill Irons are firm, and buyers are willing to meet the furnaces' views in case quality is assured. There has been some complaint among consumers that furnaces were forcing an output, with the result that some Irons were hardly up to their usual standard, the Mill Irons especially of some of the furnaces who usually rank high being a shade off color. We quote as follows:

Southern Coke, No. 1 Foundry,
new classification.....\$14.75 @ \$15.25
Southern Coke, No. 2 Foundry,
new classification.....14.25 @ 14.75
Southern Coke, No. 3 Foundry,
new classification.....13.75 @ 14.25
Gray Forge.....13.25 @ 13.75
White and Mottled, different grades.....12.75 @ 13.25
Silver Gray, different grades.....13.00 @ 13.50
Southern Charcoal, No. 1 Foundry
No. 1 Mill.....14.75 @ 15.25
Southern Car-Wheel, standard
brands.....21.75 @ 22.75
Southern Car-Wheel, other brands.....18.00 @ 19.50
Hanging Rock Coke, No. 1 Foundry.....15.50 @ 16.00
Hanging Rock Charcoal, No. 1
Foundry.....19.50 @ 21.00
Hanging Rock, Cold Blast.....20.75 @ 23.75

St. Louis.

OFFICE OF *The Iron Age*, 212 N. Sixth st.,
St. LOUIS, March 25, 1889.

Pig Iron.—There is very little of interest transpiring in this department at the present time. The improvement noted two or three weeks ago seems to have spent itself, and the market has apparently settled down into the old rut, and is at the moment dull and apathetic, with occasional sales of from 100 to 300 tons, to relieve the monotony. Prices are holding fairly well under the circumstances, and any decided increase in the demand would likely stiffen them up. Production keeps increasing, while consumption fails to show any material improvement, and stocks of Iron on the furnace banks, while they are not large at the moment, are gradually increasing. The furnaces which are at present out of the market cannot remain so very long, and any pressure to sell would probably result in lower prices. We quote as follows:

Southern Coke, No. 1 Foundry, \$15.50 @ \$16.00
Southern Coke, No. 2 Foundry, 15.00 @ 15.25
Southern Coke, No. 3 Foundry, 14.50 @ 14.75
Gray Forge.....13.50 @ 14.00
Ohio Softeners.....18.00 @ 20.00
Lake Superior Charcoal.....21.00 @ 21.50

Missouri.

Charcoal Foundry, No. 1.....16.00 @ 16.50
Charcoal Foundry, No. 2.....15.00 @ 15.50

Tennessee.

Charcoal Foundry, No. 1.....16.50 @ 18.50
Charcoal Foundry, No. 2.....17.75 @ 17.50
Connellsville Coke, f.o.b. East St. Louis, \$4.70; St. Louis, \$4.85.

Bar Iron.—The volume of business continues large and some good-sized orders have been booked during the past week to be delivered during the next 30 days. Prices, which have been the discouraging feature of this department for some time, fail to show any improvement, and it is claimed in some cases sales have been made that hardly cover cost of production. Mills are hopeful, however, and are looking forward to a revival of railroad work, which may stimulate trade and have a beneficial effect on prices. Lots from store are quoted at \$1.80; carload lots, from \$1.65 to \$1.75, according to circumstances.

Barb Wire.—A little more inquiry is reported, but as far as actual business is concerned there is no improvement. There seems to be a disposition among consumers to wait until freights are reduced, as they have been anticipating something in this line for some time. It is evident, however, that the railroads intend to maintain the present schedules, and when the consumer becomes convinced of this fact some improvement in demand can be looked for, but hardly before. Prices are weak and unsettled at about as follows: For carload lots Two and Four Point Painted, \$2.80; carload lots Two and Four Point Galvanized, \$3.40, f.o.b. St. Louis; less than carload lots, 5¢ additional.

Cincinnati.

Office of *The Iron Age*, Fourth and Main Sts., CINCINNATI, March 25, 1889.

Pig Iron.—The local trade is a unit in pronouncing dullness the most prominent feature of business in Pig Iron during the past week, but there is some difference of opinion regarding the tone of the market. The accumulation of Iron at furnaces during the past month has given buyers courage to hold off, and strengthens them in the belief that lower prices will prevail. Producers as a rule, however, have shown no disposition to force sales. Southern manufacturers of Car-Wheel Iron have about caught up with their orders and an easier feeling has prevailed. Forge Iron, too, is reported less firm, but buyers of Foundry grades have found a strong market and moderate offerings of desirable brands. A few large contracts are in process of formation, but nothing is settled. Sales have been mainly small and for present or near-by delivery. Among the larger sales have been 1000 tons Lake Superior Car-Wheel, at \$20.50, cash, and 500 tons Gray Forge, at \$13.25, cash. A rumor gives sales of this latter grade at \$13, but the report is not verified. The following are the approximate prices current here at the close, for cash, f.o.b.:

Foundry.

Southern Coke, No. 1 (new classification).....	\$15.00 @ \$15.50
Southern Coke, No. 2 (new classification).....	14.50 @ 14.75
Southern Coke, No. 3 (new classification).....	13.75 @ 14.25
Ohio Soft Stone Coal, No. 1.....	15.50 @ 16.00
Ohio Soft Stone Coal, No. 2.....	14.50 @ 15.25
Mahoning and Shenango Valley.....	16.50 @ 17.00
Hanging Rock Charcoal, No. 1.....	21.00 @ 22.00
Hanging Rock Charcoal, No. 2.....	19.00 @ 22.00
Tennessee and Alabama Charcoal, No. 1.....	18.00 @ 18.50
Tennessee and Alabama Charcoal, No. 2.....	17.00 @ 18.00

Forge.

Strong Neutral Coke.....	13.25 @ 13.50
Mottled Neutral Coke.....	12.25 @ 12.75
Gray Forge.....	13.00 @ 13.50

Car-Wheel and Malleable Irons.

Southern Car-Wheel.....	20.00 @ 25.00
Hanging Rock, Cold Blast.....	22.00 @ 25.00
Lake Superior Car-Wheel and Malleable.....	20.50 @ 21.50

Manufactured Iron.—There has been no improvement in the demand for Manufactured Iron, and a weak tone has prevailed, but prices are without quotable change.

Nails.—There has been a moderate order trade and a steady market for both Iron and Steel. 12d @ 40d sell at \$1.95 @ \$2.00 keg, with 10¢ rebate in carload lots at the mills. Steel Nails sell at \$1.90 @ \$2, and Steel Wire Nails at \$2.55 @ \$2.60 keg.

Old Material.—There has been some little improvement in the demand for Old Rails, with moderate sales on basis of \$20.50 @ \$21, cash, here. Old Wheels have been slow and easier, with moderate sales at \$17.50 @ \$18, cash.

Evans & Robertson, Iron and Steel factors, have secured comfortable and convenient quarters in the Chamber of Commerce Building, Room No. 7, to which they cordially invite members of the Iron trade and other friends.

Detroit.

WILLIAM F. JARVIS & Co., under date of March 25, 1889, report as follows: While the tonnage for the week has been above the average, the market has not shown as much strength as reports from other sections would seem to justify. Inquiries for round lots have been received, and as they come from widely separated points, the indications are that April will meet the expectations of sellers and a large amount of buying take place. For the present we quote as follows:

Lake Superior Charcoal, all numbers.....	\$19.50 @ \$20.00
Lake Superior Coke, all ore.....	18.75 @ 19.25
Lake Superior Coke, cinder mixed.....	17.75 @ 18.25
Standard Ohio Black Band.....	18.75 @ 19.25
Southern No. 1.....	17.00 @ 17.50
Southern Gray Forge.....	15.00 @ 15.50
Southern Silvery.....	16.50 @ 17.00
Jackson County (Ohio) Silvery.....	18.25 @ 18.75
Old Wheels.....	18.50 @ 19.00

Cleveland.

CLEVELAND, March 25, 1889.

Iron Ore.—Additional sales of Minnesota Ore for far Eastern furnaces are reported at prices approximating \$5.75 a ton, f.o.b. vessels, Buffalo. There are rumors of sales of Menominee Ore, also, intended for the Anthracite region, at \$5.10 @ \$5.25 at Buffalo, but the reports are not wholly verified. Some Ore from the Chapin Mine has been sold, the consolidated Steel companies at Chicago, and the price paid therefor is believed to be equivalent to \$5.15, f.o.b. vessels at Cleveland. Representatives of high-grade Bessemer Ores are not attempting to force sales, believing evidently that the improvement in the market for Bessemer Pig Iron has not reached its limit. No actual sales of Ore for delivery via Ohio ports are yet reported. Furnacemen have asked for Ores in lots varying from 10,000 to 50,000 tons, subject to the established market price. As the latter can only be fixed upon after the much-disputed question of lake freights is settled, it follows that the actual selling prices for Ore cannot yet be given. Vessel rates are still far from being fixed, several Ore men being determined to pay no more than \$1.20 or \$1.25 per ton from Ashland to Two Harbors, while others believe the rate from that port will be \$1.40. The several charters from Escanaba at \$1.10 are genuine and run through the entire season.

Pig Iron.—The market retains its firmness, but not its activity, except in Bessemer grades of iron, which are in strong demand at prices considerably in advance of the long prevailing quotations. The fact that Foundry and Forge Irons are selling less freely than was the case ten days ago is not looked upon seriously by the furnacemen, but rather as the natural result of the sudden impetus recently given the whole market. Sales of 500 and 1000 ton lots of Mill Iron at \$13.60, cash, at the

valley furnaces, are reported. There is, however, little attempt to force the market from either side, the furnacemen being quite willing to trust to the future.

Scrap Iron.—An occasional sale of Old American Rails at \$22.50 is reported. Large quantities of Old Wheels are for sale at \$19, and No. 1 Scrap sells at the same price.

New York.

Office of *The Iron Age*, 65 and 68 Duane street, New York, March 27, 1889.

If anything the feeling is weaker. Although there have not been any new sales of any consequence at lower prices, there are indications that the tendency is downward. Commission merchants here are in receipt of letters from a number of parties asking them to undertake the placing of blocks of Iron at reductions in price, the parties in question being concerns who usually seek a market through other channels, or sell direct. It is reported that outsiders are offering mixed blocks of No. 1 and No. 2 Foundry at a very low price, delivered at tidewater. The effect of Southern competition is being felt, too, in another way. Important consumers are not taking their usual quantity of Northern Iron, and in reply to questions frankly admit that they are melting considerable Southern Pig purchased \$1 less than what Northern Standard Iron costs them. We quote for standard Northern brands, tidewater delivery, \$17.50 @ \$18 for No. 1 Foundry; \$16.25 @ \$17 for No. 2 Foundry, and \$15 @ \$15.50 for Gray Forge.

Scotch Pig.—We quote: Coltness, \$20.50 @ \$21; Shotts, \$20 @ \$20.50; Langloan, \$20 @ \$20.50; Summerlee, \$20.25 @ \$20.50 and Dalmellington, \$19.25 @ \$19.50.

Spiegeleisen and Ferromanganese.—There is little doing in Spiegeleisen, which we quote nominally \$27.50 @ \$28 for German, and \$28 @ \$28.50 for English. In Ferromanganese the demand is quite good, and sales have been made at \$57, New York, with some important business pending.

Structural Iron.—We quote: Sheared Plates, 1.9¢ @ 2¢; Universal Mill Plates, 2¢ @ 2.1¢; Angles, 1.9¢ @ 2.1¢; Tees, 2.35¢ @ 2.5¢; and Channels and Beams, 2.8¢, on dock.

Plates.—We quote Iron Tank, 1.9¢ @ 2.2¢; Shell, 2.25¢ @ 2.4¢; Steel Tank and Ship Plate, 2.1¢ @ 2.25¢; Shell, 2.35¢ @ 2.5¢; Flange, 2.6¢ @ 2.75¢, and Fire-box, 3¢ @ 4¢.

Bar Iron.—We quote: Carload lots on dock, half extras, Common, 1.6¢ @ 1.65¢; Medium, 1.65¢ @ 1.7¢, and Refined, 1.7¢ @ 2¢.

Steel Rails.—Aside from a few small lots there has been no business, either East or West, and the outlook is unsatisfactory except to a few mills who are fairly well booked up to and during the summer months. No more purchases of allotment have been made, an option for an additional quantity not having been availed of by the mill, which has taken in all 28,000 tons. We quote for large lots, standard sections, \$27 @ \$27.50, at Eastern mill.

Wire Rods.—There has been no business in Foreign Basic, which is quoted at \$41.25 @ \$41.50. A lot of a few hundred tons of Belgian Acid Rods on dock here is being offered at \$39.50.

Old Rails.—A small lot of consigned Foreign Old Rails has gone into store because \$23 could not be obtained for them. We quote, nominally, \$23 for Tees.

Scrap Iron.—Very little inquiry, the mills buying to cover immediate requirements only. It is said that low figures have been named to buyers of Choice No.

1 Scrap, but in spite of these inducements the stock in yard remains large. We quote: No. 1 Scrap, \$20.50 @ \$21, far carload lots, delivered; Turnings, \$13 @ \$14, for cargo lots, do; Cast Scrap, \$15.50 @ \$16, do; and Horseshoes, \$23 @ \$23.50.

Track Material.—We quote Spikes: \$2 @ \$2.05, and Angle Bars \$1.75 @ \$1.85, delivered.

Financial.

The commercial situation is improved, particularly in respect of those departments most sensitive to speculation, the collapse in Copper being already regarded as among past events. Wheat has dropped to a basis where export trade is possible, and a larger outward movement is observed than before for a long time. Wheat became higher on the Government report showing a reduction of 25,000,000 bushels in the crop, but broke on Saturday on the news of higher duties in Portugal, our principal export market. Provisions are going out freely. From the Atlantic ports there were taken last week 8,151,000 lb lard, against 4,128,000 lb last year, besides 8,085,000 lb bacon, against 6,203,000 lb last year. Sugar tends steadily upward, equal to 1¢ $\frac{3}{4}$ lb for refined within two months. Other markets quiet. The Chicago *Tribune* says the spring crop prospects are phenomenal. Winter wheat is everywhere thriving. Anthracite coal is phenomenally dull, but bituminous is active. All the collieries in the Pittston region, including the Pennsylvania Coal Company, Lehigh Valley and individual operators, suspended mining operations for six weeks.

The Stock Exchange market was dull and featureless; the possibility of financial disturbance in Paris and London growing out of the copper speculation and consequent depression in this market has operated to discourage investors. The decline in the prices of anthracite and the unsatisfactory condition of the iron trade exerted a like tendency. Considerable amounts of securities are believed to have been sold on foreign account. The unfavorable bank statement had no other effect than to strengthen the bearish sentiment. Burlington and Quincy declined to the lowest point yet reached, a good deal of this stock coming on the market from Boston. On Tuesday there was much more activity than for some days previously, there being an increased business in Atchison, Burlington and Rock Island. The movement was irregular in the morning, but in the afternoon Atchison, Topeka and Santa Fé again declined and the tone was irregular to the close.

United States bonds were quoted as follows:

U. S. 4½s, 1891, coupon.....	107½ @ 108½
U. S. 4s, 1907, coupon.....	129¼ @ 129½
U. S. currency 6s, 1895.....	120
U. S. currency 6s, 1896.....	123
U. S. currency 6s, 1897.....	123
U. S. currency 6s, 1898.....	120
U. S. currency 6s, 1899.....	131

General trade begins to feel the opening spring, attended with the opening of navigation on the rivers, canals and lakes, even the Straits of Mackinaw being navigable without difficulty. This is the earliest opening between the upper and lower lakes of which there is any record. One immediate effect will be the sailing from Chicago of a large fleet of grain vessels to discharge at Buffalo. Railroads already complain of competition by the water routes.

The weekly statement of the Associated Banks shows an unexpected decrease of reserve amounting to \$1,371,950, so that the surplus now stands at \$6,698,925. The currency movement was heavily against this city, Boston drawing in large amounts. Loans increased \$905,400; specie was down \$1,198,800, and deposits decreased \$1,182,200. It is now stated

that the Secretary has decided to continue the policy of his predecessor regarding purchases of bonds, and it is supposed that he will soon commence to buy 4%. Time money for five, six and seven months is quoted at 5%. Commercial paper was in a little better demand last week owing to the fact that some of the banks had come into the market as buyers, but rates were not materially changed. The offerings of bonds since March 4 have been somewhat less liberal than previously, and have been chiefly of 4½s, although there have been repeated efforts to tempt the Secretary into the purchase of 4s. The total amount of bonds purchased to date under the circular of April 17 is \$126,208,500, of which \$51,337,800 were 4½s and \$74,871,200 were 4s.

The clearings of 40 cities last week were \$1,015,989,076, an increase of 11.5%. New York gained 12.8, Boston 2, Chicago 8.7, Philadelphia 14.9, St. Louis 10.8, Cincinnati 11.3, San Francisco 5.9, New Orleans 23.9, Pittsburgh 26.2, Kansas City 16.1, Louisville 26.5, Milwaukee 18.1, Omaha 30.7, Denver 33.7, Cleveland 15.8, Memphis 41.6, Richmond 53.9 and Duluth 15.9%. Baltimore decreased 28 and Los Angeles 42.5%.

Sterling exchange was unaffected by the financial flurry in Paris, and was dull at \$4.86½ @ \$4.89½. A shipment of \$1,000,000 in gold was on special order rather than an exchange operation. London, however, at latest advices, was expecting large arrivals from America, and, in view of failures supposed to be impending in connection with metal, financiers were moving with caution. The London *Statist* says the crippling of trade in France is inevitable; and that the injurious effects will be felt not only in Europe, but in South American commerce.

The *Financial Chronicle* computes the gross earnings of 122 roads for February at \$25,434,878 on 71,577 miles of road, an increase of \$1,261,838, and in mileage of 2833, as compared with last year. The indications are that the shading of rates by the roads tributary to Duluth, and by those that feel that they are competitors of those roads, has not as serious an effect upon earnings as Western advices would lead the public to believe. This is an irregularity that can be localized, and it will be the first work of the Interstate Traffic Association and of Chairman Walker to adjust these differences, or at least to confine them to the roads directly interested.

The Bank of North America, of which William Dowd is president, removed to its new quarters on Nassau and Cedar streets.

Creditors of the Reading Iron Works learned that instead of the company having made \$600,000 in the last four years, as stated at their first meeting, there was, in fact, a loss of \$263,000. There has also been a shrinkage of nearly \$500,000 in the book accounts, and only \$380,000 of stock and material on hand, instead of \$600,000 worth.

The imports of merchandise at this port during the week were valued at \$11,225,000, of which \$3,488,000 represents dry goods. Since January 1 the aggregate is \$122,798,000, as compared with \$114,995,000 for the same time last year and \$108,000,000 in 1887. Exports were decidedly larger, amounting to \$7,807,241. Since January 1 the total is \$81,871,700, against \$67,991,000 for the same time last year. According to the custom-house report, the exports of specie from New York during the week were \$1,962,000, making a total since January 1 of \$10,448,000, against \$6,462,000 for the same time last year.

Durham furnace, anthracite, at Riegelsville, Pa., owned by Cooper, Hewitt & Co., has blown in.

Metal Market.

Copper.—A week ago London had declined to £40 all round; since then there was an improvement of a couple of pounds sterling, but closing again at £41 @ £41. 10/, spot, and £41. 5/, futures, 65 tons Rio Tinto Cakes bringing, at auction, £44. 7/6 yesterday. It is cabled from Paris that a judicial inquiry into the facts bearing upon the formation of the syndicate has been ordered. A good many complications may arise on this side in the near future as to the carrying out of the contracts made prior to the failure of the Société des Métaux, like, for example, the stopping of delivery on the part of mining companies for two months from March 15, the pool sale to consumers of 14,000,000 at 16½¢, to be delivered from March 1 to May 31. If, in view of recent events, the American parties to any of these contracts should try to repudiate them, in whole or in part, the question would arise whether the agents of the syndicate can enforce them. The said pool sale, it should be remarked, however, was made in the name of the Calumet and Hecla. The 20 per cent. suspension of production by the companies was agreed to by the latter, with the understanding that the "Société" was to resume its purchases subsequently, which, since it failed, it evidently cannot. The companies, it is true, hold bank credits as a security for the fulfillment of the contracts, but it is questionable whether these will prove available, even with the best banking concerns, under the circumstances, in all cases. Another question arises as to the lot, or lots, of Copper from which deliveries to consumers are to be made. While all these points are naturally canvassed actual business on this side is kept in suspense, and quotations remain nominally 14½¢ @ 15¢ for casting brands.

Henry R. Merton & Co., of London, have just published their annual estimate of the production of Copper. Making minor changes where official data are available, we reach the following:

Countries.	1888.	1887.	1886.
Europe:	Long tons.	Long tons.	Long tons.
Great Britain.....	1,500	3,891	1,471
Spain and Portugal:			
Rio Tinto.....	32,000	26,668	24,700
Tharais.....	11,500	11,000	11,000
Mason & Barry.....	7,000	7,000	7,000
Sevilla.....	1,700	2,300	2,125
Portuguesa.....	900	856	1,258
Poderosa and others.....	7,300	4,060	3,560
Germany:			
Mansfeld.....	13,380	13,025	12,596
Other German.....	1,850	1,850	1,970
Austria.....	1,010	888	550
Hungary.....	858	581	500
Sweden.....	900	906	600
Norway.....	1,570	1,450	2,220
Italy.....	2,500	2,500	400
Russia.....	4,700	5,000	9,975
Total Europe.....	88,568	78,462	75,234
North America:			
United States.....	100,667	80,768	69,971
Canada.....	2,250	1,400	1,440
Newfoundland.....	2,050	1,345	1,125
Mexico.....	2,768	2,050	850
Total North America.....	107,733	85,523	73,386
South America:			
Chili.....	31,240	29,150	26,025
Bolivia:			
Corocoro.....	1,450	1,300	1,100
Peru.....	250	50	75
Venezuela:			
New Quebrada.....	4,000	2,900	3,708
Argentine Republic.....	150	170	180
Total South America.....	37,090	33,570	40,088
Africa:			
Algiers.....	50	150	110
Cape of Good Hope.....	7,500	7,250	6,015
Total Africa.....	7,550	7,400	6,125
Asia:			
Japan.....	11,000	11,000	10,000
Total Asia.....	11,000	11,000	10,000
Australia:			
Australia.....	7,450	7,700	9,700
Grand total.....	250,391	223,585	214,533

At least one small lot of Copper is on its way back, and the market abroad has been pretty thoroughly scoured to secure

American Copper in original packages. It seems that up to date very little has been secured. When the Copper has been taken from its original packages abroad a good deal of difficulty is encountered in getting it in here. It remains to be seen whether European consumers have much which they can reship. Thus far no news has been received concerning the negotiations now progressing in Paris. We discuss the situation at length elsewhere.

Tin.—Pending the publication of statistics at the end of the month, Tin has ruled dull in London and rather easier, Spot going from £94 to £93. 15/ yesterday, and futures from £95 to £94. 10/, with sales of 100 tons. Here hardly anything transpired, 10 tons April bringing 21½¢, and 10 tons May, 21.20¢, closing heavy at 20.85¢ @ 21.20¢ for March and April. The January shipments from the Straits settlements to the United States were 9079 piculs, against 5891 in 1888; 9167 in 1877; 5045 in 1886; 1260 in 1885, and 6476 in 1884. The closing Spot quotation on a quiet market to day is 21½¢ @ 21¼¢. **Tin Plates.**—Although the trade on the spot has not assumed much greater proportions than before, there has been great firmness and a hardening tendency. Large dealings have meanwhile taken place in futures at gradually improving prices, in sympathy with the strong position in England. We quote at the close, large lines, $\frac{3}{4}$ box: Siemens-Martin Steel, Charcoal finish, \$4.75 @ \$5.50; Coke finish, \$4.65 @ \$4.70; Terns, \$4.12 @ \$4.25; Coke Tins, \$4.22½ @ \$4.30, and Wasters \$4.12½ @ \$4.15.

Lead.—Slightly greater activity has developed at easier rates, some 350 to 400 tons changing hands at 3.65¢, which remains the closing quotation, but very little to be had at this figure. St. Louis has been active at 3.45¢.

Spelter.—The market has been decidedly weak and the few sales effected have gone as low as 4.70¢ for Common Domestic. Silesian is 5½¢, nominally.

Antimony.—Dealings have been confined to a moderate jobbing trade at 12¢ for Hallett and 13½¢ for Cookson.

New York Metal Exchange.

The following sales are reported:

THURSDAY, March 21.	
10 tons Tin, May.....	21.20¢
10 tons Tin, April.....	21.25¢
16 tons Lead, August.....	3.80¢
25,000 lb Lake copper, March.....	15.80¢
28,000 lb G. M. Copper, March.....	11.50¢
28,000 lb G. M. Copper, March.....	11.35¢
28,000 lb G. M. Copper, July.....	10.00¢
FRIDAY, March 15.	
16 tons Lead, April.....	3.70¢
MONDAY, March 18.	
100 tons Lead, April.....	3.65¢
TUESDAY, March 19.	
100 tons Lead, September.....	3.75¢
WEDNESDAY, March 27.	
32,500 lb Lead, July.....	3.75¢

Coal Market.

Reduced prices and short time at the mines alike fail to stimulate the demand for Anthracite, and the complaint of dullness has become a chronic condition. An examination of the statistics shows that, despite the efforts to restrict, production has steadily increased for three weeks past, and averaged 512,000 tons every week. During the week ending March 23 the total was 536,938, a decrease of 140,000 tons compared with the same week last year. Since January 1 the aggregate is 6,378,318 tons, a decrease of 600,000 tons compared with 1888. The present determination on the part of the companies appears to be to maintain prices by controlling production, with the expectation that in July mining can be resumed in full force. Nevertheless individual miners possessing large interests, while professing to "follow the market," cause more or less irregularity

and reports of concessions are freely circulated. The stock of Anthracite Coal at tidewater on February 28 was 887,216 tons, against 232,500 tons last year and 470,609 tons in 1887. The Philadelphia Ledger says: "The collieries now running are being operated principally to supply the demand for fuel from iron furnaces and manufacturers. A number of iron furnaces have recently gone out of blast, and consequently the consumption of the furnace sizes has decreased."

Free Burning, f.o.b., is quoted as follows; Broken, \$3.75; Egg, \$3.90; Stove, \$4.15; Chestnut, \$4; Lehigh, Lump and Broken, \$4.10; Egg and Chestnut, \$4; Stove, \$4.15.

A decision in the Coxe Bros. suit against the Lehigh Valley road is expected in about one month.

A meeting of freight agents to consider a reduction of tolls at tidewater was to have taken place yesterday in this city, but in the absence of principal parties action was postponed. To-day the Western Association meet to harmonize prices with the recent reduction here.

The Anthracite Coal-producing companies have agreed upon the division of output for the coming year, as follows:

	New per cent.	Old per cent.
Reading.....	21.45	21.63
Lehigh Valley.....	17.13	18.97
New Jersey Central.....	15.24	15.98
D., L. and Western.....	18.03	15.54
Delaware and Hudson.....	10.97	10.65
Pennsylvania Railroad.....	10.80	10.45
Pennsylvania Coal Co.....	4.15	4.84
Erie.....	2.23	1.94
Totals.....	100.00	100.00

The Pennsylvania Railroad Coal tonnage for the year thus far is 2,200,264 tons, a decrease of 253,000 tons. Reading reports for the week 110,000 tons, of which 15,000 were discharged at Port Richmond and 9000 at Port Liberty.

Bituminous Coal is unchanged. The problem now is to market the production and pool issues.

Imports.

Hardware, Machinery, &c.

American Bank Note Co., Mach'y, cs., 2
Boker, Hermann & Co., Arms, cs., 27; Mds., cs., 4
Bregaro, E., Mach'y, bxs., 2
Corbiers, Fellows & Co., Mach'y, cs., 15; ditto, crates, 20
Doris, Moses, Arms, cs., 4
Einstein, J. D. & Co., Mach'y, pkgs., 15
Field, Alfred & Co., Mds., cs., 4
Godfrey, J., Arms, cs., 30
Graef Cutlery Co., Cutlery, cs., 8
Hobbs Hardware Co., Plate Glass, cs., 7
Hartley & Graham, Arms, cs., 9; Mds., cs., 13
Hausch, George, Mach'y, csc., 1
Johnson, J. & Co., Mach'y, pkgs., 181
McCoy & Sanders, Iron Chains, cks., 24
Mulford, Carey & Conklin, Iron Nails, bags, 638
Rotterdam S. S. Co.'s Agent, Arms, cs., 11
Sheldon & Co., G. W. Arms, cs., 20
Stark, Sheras & Co., Arms, cs., 10
Schoverling, Daly & Gales, Arms, cs., 25
Sears Commercial Co., Mach'y, csc., 1
Taylor, Thos., Mds., cs., 6
Thebaud Bros., Engines, 6; parts ditto, pkgs., 81
Wiebusch & Hilger, Mds., cs., 30; Hdws., cks., 11; Anvils, 202
Wilson, F., Mach'y, csc., 1
Witte, John G. & Bro., Cutlery, cs., 14
Order, Mach'y, pkgs., 25; Nails, kegs, 108

Yaquina Bay, 115 miles south of the Columbia River, will soon become an important seaport, with 32 feet of water on the bar when the jetties now building by the general Government are completed. About \$300,000 have already been expended on this work. At average high tides there is now from 28 to 24 feet of water on the bar. The deepest water on the Columbia River bar is only 30 feet. Ships entering the Columbia River are at the expense of towage to Portland, over 100 miles, to reach railroad transportation. Ships that can go to Portland and load to their full capacity can enter Yaquina Bay and reach transcontinental railway connections in 20 minutes after crossing the bar. Yaquina Bay inside is 1½ miles wide, 6 miles long and perfectly land-

locked. All the vessels on the Pacific Coast could ride safely at anchor in this bay at the same time. Inside of the bar there is from 30 to 45 feet of water.

British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, March 27, 1889.

The Copper market has developed a much firmer tone and Merchant Bars found quick sale at between £41 and £42. There is now a hopeful feeling here, and the belief is general that the worst has passed. Brokers representing consumers are eager buyers for considerable quantities which, if negotiated, would greatly reduce the stocks. Trading is checked, however, by the fact that material is not obtainable from the producing companies, the latter not being free to sell until matters between themselves and the syndicate are more clearly defined.

It is reported that the syndicate owes mining companies large sums for Copper delivered, including £25,000 to the Tharsis Company. One company is said to have been unable to pay an intended dividend owing to default in payments by the syndicate.

A new pool is forming to purchase the syndicate's stocks at an average of about £45, provided arrangements now pending with the mining companies as to future output come to a satisfactory termination.

Messrs. Morrison, Kekeovich & Co., brokers, have made their creditors a material payment on account of contracts executed in the firm's name, and will proceed against the Société des Métaux syndicate for the balance. This enables the firm to proceed with business as heretofore. Articles of the new Comptoir are settled.

The fluctuations in prices of Block Tin have been small and little business has been transacted. The market has fully recovered from the late uncertainty.

Tin Plate has been in brisk demand, Terns more especially, and prices for all kinds are decidedly stronger. The much-talked-of syndicate to control supplies is no longer seriously considered.

There has been a large business in Pig Iron warrants and prices for Scotch have advanced to 44/6. The statistical position is pleasing to operators for a rise and the demand for consumption continues brisk. Middlesboro' Pig has advanced 3d and Hematites are fully 1/ dearer.

Large Government orders for Steel have been given out in Scotland and prices are higher throughout. The general demand has been better than during the preceding week in most branches. Slabs and Wire Rods are exceptionally quiet. Manufactured Iron of all descriptions is strong and active.

There is no improvement in the demand for old material, and prices are greatly nominal. A parcel of Flanged Rails was offered at 54/6 in London and found no takers.

Cleveland Pig.—The demand has continued active, and prices show a further advance. No. 3 Middlesboro', G.M.B., 37/9.

Bessemer Pig.—Trade in this line still large and the market strong at 1/ advance. West Coast brands, mixed numbers, 48/8, f.o.b. shipping point.

Scotch Pig.—There continues to be a brisk demand, and the market is strong, with prices again higher on some brands.

No. 1 Coltness, f.o.b. Glasgow	56/
No. 1 Summerlee, " "	55/
No. 1 Gartsherrie, " "	52/
No. 1 Langloan, " "	55/
No. 1 Cambro, " "	47/
No. 1 Shotts, " at Leith	53/8
No. 1 Glengarnock, " Ardrossan	50/8
No. 1 Dalmellington, " "	45/8
No. 1 Eglington, " "	44/8
Steamer freights, Glasgow to New York, 5/;	
Liverpool to New York, 10/.	

Spiegeleisen.—The demand is fairly active and prices are firm. English 20 % quoted 80/, f.o.b. N. W. England shipping point.

Steel Rails.—A large demand continues, and the market is strong, without, however, any rise in prices. Heavy sections quoted at £4. 7/6, and light sections £4. 15/ @ £4. 17/6, f.o.b. at N. W. England shipping point.

Steel Blooms.—There is only a moderate demand, but prices are firm. We quote £3. 19/8 for 7 x 7, f.o.b. at N. W. England shipping point.

Steel Billets.—A fair business has been done, and prices remain firm. Bessemer, 2½ x 2½ inch, £4. 6/3, f.o.b. at N. W. England shipping point.

Steel Slabs.—No improvement in the demand. Some sellers name slightly lower prices. Bessemer £3. 18/6, f.o.b. at N. W. England shipping point.

Old Rails.—The market continues flat, and prices are nominal. Tees quoted at £3. 5/ @ £3. 6/6, and Double Heads, £3. 10/ @ £3. 12/6, c.i.f., New York.

Scrap Iron.—There is but little doing, and prices are without change. Heavy Wrought quoted at £2. 2/6 @ £2. 5/, f.o.b.

Crop Ends.—Transactions are still moderate, but holders remain very firm. Bessemer quoted £2. 10/ @ £2. 12/6, f.o.b.

Tin Plate.—The market is strong and fairly active, with business at the advanced prices. We quote, f.o.b. Liverpool:

IC Charcoal, Allaway grade	15/3 @ 15/9
IC Bessemer Steel, Coke finish	14/3 @ 14/6
IC Siemens " "	14/3 @ 14/6
IC Coke, B. V. grade	13/9 @ 14/
Charcoal Terne, Dean grade	12/6 @ 13/

Manufactured Iron.—A large business has been done. The demand is still active and the market strong. We quote, f.o.b. Liverpool:

Staff. Ord. Marked Bars	£ s. d. @ 8 2 6
Common " "	£ s. d. @ 5 12 6
Staff. Bl'k Sheet, singles	£ s. d. @ 7 12 6
Welsh Bars (f.o.b. Wales)	£ s. d. @ 5 2 6

Copper.—The market quieter, after a good week's business, but fairly steady. The quoted prices at the close were: Bars, £41 for spot; £40. 10/ @ £41 for three months' futures. Best Selected, £47.

Tin.—The demand fair and prices steady. Straits quoted at £98. 15/, spot, and £94. 15/ for three months' futures.

Lead.—Trade has been slow and prices are a trifle weaker. Quoted at £12. 7/6 for Soft Spanish.

Spelter.—The demand moderate and sales at 5/ decline. Quoted at £17 for ordinary Silesian.

The North German Lloyd is becoming an enormous steamship corporation. Orders have been given for two more steamships of 5000 tons each, to be built in Scotland, in addition to five others in process of construction in Kiel and Stettin. These completed will swell the North

German Lloyd fleet to 73 steamers of a total tonnage of 172,000 tons, with 158,000 horse-power. There is scarcely another mercantile fleet like it as regards the number of steamers and the variety of lines of communication.

Foreign Markets.

EQUIVALENTS.

Franc, Peseta or Lira	Cents.
Florin (Netherlands)	10.3
Florin (Austria)	40.2
Witels (Portugal)	55.9
Witels (Brazil)	\$1.08
Mark (Germany)	54.6
	23.8
Gram	Pounds
Picul	2.206
	134.

WEST INDIES.

PORT OF SPAIN, TRINIDAD, February 15, 1889.—**Asphaltum.**—During the fortnight there has been a steady, moderate demand at \$14.04 per ton Boiled and \$6.84 Crude. Since January 1 1889 tons have been shipped, against 8536 same time last year and 1828 in 1887. **Exchange.**—Ninety days' sight on London, \$4.74 @ \$4.80.—**E. P. Masson**

EAST INDIES.

SINGAPORE, February 12, 1889.—**Tin.**—Our last review was dated 28th ult. The Chinese New Year holidays have taken up a great portion of the interval, and there is, in consequence, but little business to report. As was to be expected, the arrivals of Tin have not been large, which rather helps dealers in their present attitude—that of holding off—while prices are moving upward in sympathy with the home markets. Steamers clearing from here and Penang during the fortnight will have on board at least 2700 tons. The closing price is \$36.25 per picul, at which there are buyers. **Gum Copal.**—Stocks are large, but firmly held for higher prices. There is a fair demand. **Gum Damar.**—No supplies have come in since the holidays. **Tonnage.**—The regular liners are more or less again in possession of the market, with the result that rates have risen to 42/6 for dead weight to London. **New York via Cape.**—The vessels noted in our last are loading. There have been no fresh fixtures. **Via Canal.**—The Duke of Westminster passed through a few days ago, taking Tin at 27/6. For Boston there are no fresh charters. **Exchange,** 3/1½ for 6 months' draft, with a hardening tendency. January Tin shipments from the Straits Settlements to the United States have been as follows: 9079 piculs, against same time last year 5891; in 1887, 9167; in 1886, 5045; in 1885, 1280, and in 1884, 6476.—**Gillfillan, Wood & Co.**

MANILA, March 4, 1889.—**Hemp.**—There are buyers at \$15 15-16, against \$7½ in 1888, equaling per ton, cost and freight, \$53. 10/, against \$28. 7/6. Clearances for the United States since January 1 amounted to 82,000 bales, against 39,000 in 1888; loading, 22,000, against 15,000; cleared for England since January 1, 65,000 bales, against 72,000; loading for do, 1000, against 30,000; cleared for all other ports, 8000, against 15,000; receipts at all ports since last cable, 18,000, against 15,000, and since January 1, 149,000, against 128,000 and 94,000. **Freight.**—\$7.50, against \$5. **Exchange,** 6 months' sight, 3/7½, against 3/8½.—**Ker & Co., per cable direct to their agent in New York, Mr. Charles Nordhaus, 89 Water street.**

COLOMBO, February 14, 1889.—**Plumbago.**—A fair business has been transacted during the fortnight at ensuing quotations, in rupees per ton: Large Lumps, 145 @ 170; Ordinary Lumps, 125 @ 160; Chips, 80 @ 95, and Dust, 40 @ 64. Shipments since October 1 have been as follows: To England, 47,612 cwt.; to Hamburg, 4419; to Bremen, 659; 3086 to Antwerp, 63 to India, 88 to Australia and 36,810 to the United States; together, 92,737, against same time last year, 111,486; 84,523 in 1887, and 65,954 in 1886. **Coir Yarn** is moderately active and steady at from 7 to 12 rupees per cwt, Nos. 1 to 4. **Exchange.**—Six months' sight, 1/4 31-32.—**Volkart Brothers, to Mr. John W. Greene, 82 Wall street, New York.**

BELGIUM.

BRUSSELS, March 16, 1889.—**Iron.**—The Belgian iron markets continue firm and well sustained. Beams, in spite of French and German competition, are bought in Belgium as extensively as ever for export. Orders have dropped in from Holland and her colonies, the price obtained for these Beams being 143.09 @ 148.22 francs per ton, free on board at Rotterdam. On some railroad bridges for Spain the Creuzot has, however, beaten our makers. Out of the 50 blast furnaces there are in Belgium 30 were in operation on March 1 and 20 blown out. The February production was 46,000 tons of Forge

Pig, 5740 Foundry do. and 17,780 Bessemer; together, 69,580 tons of Pig Iron.—**Moniteur des Intérêts Matériels.**

GERMANY.

HAMBURG, March 16, 1889.—**Iron.**—The Rhenish Westphalian Iron market has been characterized by unwavering stiffness, upheld by a good consumptive demand. Prices are tending upward, especially as regards Pig. Spiegel continues being taken as freely as before, both for export and domestic use, at 63 marks for 10 @ 12 per cent. Manganese. Forge Pig is being contracted for all the way to October 1, No. 3 being 1 mark higher. We quote the same 54 marks per ton, and Foundry Pig, which is steady, 54 @ 63. Thomas is wanted at 47; Bessemer moderately so at 56; English at 46/9; the range for Luxembourg is 38 @ 46. Although the inquiry remains active, the syndicate of rolling-mill owners has deemed it more advisable not to advance the price in proportion to the improving raw material. The Wire branch does not yet emerge from its apathy. Car works, foundries and machine shops are all kept busy. The quotations at Dortmund are 128 @ 130.50 for Merchant; Wire Rods, 114 @ 120; Steel Rails, 120 @ 128, and Steel Rails for mines, 110 @ 115. **Metals.**—Lead is firm at 13.10 @ 13.40, German Pig; Spelter, Silesian, spot and futures, 8 @ 9 marks.—**Borsenhalle.**

Natural gas at Muncie, Ind., is working wonders. The average well yields 4,000,000 cubic feet of gas per day, which is equal to 200 tons of coal, and this fuel is as "free as the water which is pumped into the boiler." There are now 33 wells in operation in Muncie, averaging a capacity of 5,000,000 cubic feet each; and the largest of these wells has a capacity of something like 12,000,000 cubic feet. Altogether the capacity of these wells is reckoned at at least 100,000,000 feet, equal to 500,000 tons of coal, a day. As the lowest cost of coal is \$2 a ton, the daily capacity of the wells already existing there is equal to \$10,000 a day, or over \$3,000,000 a year. According to estimate, every 10 acres will support a well. Supposing that there should be, on the average, one well to each 40 acres, or 576 wells to the entire township, and estimating the value at only \$200 a day, or just one-half the amount computed by experts, the gas-flow of these 576 wells would be worth \$115,200 a day, or \$41,048,000 a year. There are 54 factories already located in Muncie, and the amount of gas they consume is equivalent to the heating power of 125,000 tons of coal, or a value of at least \$250,000, all obtained simply for the cost of sinking a well and laying pipes, and supplying other requisite appliances for its control. About the same amount of fuel is consumed there now for domestic purposes.

A Boston newspaper publishes the following in its financial column: The letters credit of the Boston and Montana Copper Company were issued, as has often been remarked, by the Messrs. Baring Bros. & Co. Those of the Tamarack, Calumet and Hecla and the other companies were issued by the Comptoir d'Escompte. Tamarack people furnish these particulars regarding the Boston and Montana and Tamarack and Osceola credits:

	Boston and Montana.	Tamarack.	Osceola.
Expire.....	Dec. 31, 1890.	Feb. 1, 1891.	May 1, 1890.
Amount.....	\$4,875,000	\$6,500,000	\$520,000
Withdrawn....	1,142,829	458,250	200,000
Available...	\$3,732,170	\$6,041,750	\$320,000

That the new Comptoir d'Escompte or any new combination will assume the letters credit and other obligations of the old Comptoir now in liquidation is at least problematical. The Baring Bros. will have to take the product of the Boston and Montana, and may reasonably be expected to support any proper measure calculated to maintain the price of copper at about 12 cents or higher per pound, the contracting price with this company being a fraction under 12 cents.

S. W. Goodridge, Grafton, Vt., issues a price list of a line of Fishing Rods of which he is manufacturer. In the introductory circular it is mentioned that in

making these Rods no machinery is used, each joint being worked out by hand, and all parts showing imperfections being rejected. The quality of the wood and the care taken in manufacturing the Rods are also referred to. In addition to his regular line, we are advised that he is making a Rod of lancewood or greenheart on the same principle as the Split Bamboo, which is referred to as giving special satisfaction, the gluing up of it being said to add greatly to its elasticity and strength.

The Edward Storm Spring Company, Poughkeepsie, N. Y., for whom J. H. Graham & Co., 113 Chambers street, New York, are agents, have issued a revised edition of their catalogue, describing their Dumb Waiters and Hand Elevators—the New York Safety, Manhattan and the Humphrey. Attention is also called in it to Ives' patent Door Bolts and Sash Locks, and Lane's Door Hangers and Tracks.

The Lloyd & Supplee Hardware Company, Philadelphia, issue a circular in the form of a paper called *Blades of Grass*, in which they describe the Pennsylvania and the Continental Lawn Mowers, giving illustrations of the different patterns and pointing out the advantages of their construction. Other information is given relating to Lawns and Lawn Mowers and some miscellaneous matter of interest.

The Peerless Wringer and Mfg. Company have moved their factory from Cincinnati to Cleveland, Ohio, and consolidated the Mercantile Mfg. Company with the Peerless Wringer Company. Their new factory is fitted up with late improvements and modern machinery and situated at the junction of two leading lines of railway, thus giving them excellent shipping and manufacturing facilities and putting them in a position to turn out a large quantity of Wringers.

A circular has been issued by Goulds, Austin & Caldwell Company, 167 and 169 Lake street, Chicago, announcing that they have purchased the interest of F. C. Austin in that corporation, and that the business will hereafter be under the entire control and management of Robert W. Caldwell, aided by an experienced corps of assistants. They request that all correspondence intended for them be addressed to the company and not to Goulds & Austin.

The Planet Screw Showcase, formerly manufactured by W. I. Gardiner & Co., Seymour, Ind., is now made by Gardiner & Cross, Louisville, Ky.

Cordley & Hayes, 37 Barclay street, New York, have recently issued a new price list for the trade on Indurated Fibre Ware, showing a large variety of goods lately added to their line. The growth of their business is such that they find their present quarters insufficient and have leased the large double store, 173 and 175 Duane street, New York, to which they will remove in April.

Dame, Stoddard & Kendall, 374 Washington street, Boston, Mass., issue a convenient catalogue devoted to Lawn Tennis, Croquet and general Athletic Goods for the season of 1889-1890. An interesting line of these goods is exhibited, including Photographic Outfits.

Goodnow & Wightman, Boston, Mass., issue a convenient price list of the extensive line of Tools for machinists, pattern-makers, carvers, cabinet-makers, amateurs, jewelers, &c., which they manufacture. It is fully illustrated and gives the retail prices at which they sell the goods.

Blood's Patent Adjustable Hose Holder, which is put on the market by C. H. Taisey, Denver, Col., is shown in the advertisement on page 65. This article holds any size Hose from $\frac{1}{4}$ to 1 inch in any desired position for watering a lawn. Its

simplicity, neatness of appearance and adjustability are points that are made in regard to it.

I. F. Force, New Albany, Ind., issues a convenient price list without illustrations showing the line of Axe, Pick, Hammer and other hickory Handles of which he is manufacturer.

Empire Mfg. Company, Forestville, N. Y., issue a neat catalogue illustrating their line of Step-Ladders, Wash-Benches, Ironing-Boards, &c. They advise us that they keep on hand a full line of these goods, so that they are in a position to fill orders without delay.

William Read & Sons, 107 Washington street, Boston, Mass., issue an attractive pamphlet describing the New Mail for 1889. A full description is given of this machine, with many testimonials in regard to its merit. The New Mail Safety is also illustrated and also the American Ideal, Ideal Tricycle and American Ideal Tandem.

Abbey & Imbrie, 18 Vesey street, New York, issue a very complete catalogue of nearly 150 large pages, in which they represent a very complete line of Fishing Tackle. It begins with Fish-Hooks, of which a very large assortment is exhibited, the cuts being the actual size of the Hooks. It passes on to Flies, of which selected patterns are shown and descriptions and list prices of others given, Lines, Sinkers, Rods, Reels, Spoons, Spinners, &c., and a large variety of specialties following. The pamphlet closes with a convenient and interesting codification of the game fish laws in the different States, showing at a glance where the different kinds of fishing are lawful.

Moore & Barnes Mfg. Company, 103 Chambers street, New York, have established an agency for their goods with the well-known and enterprising house of Cutler, Woodrough & Co., 19 Lake street, Chicago, where a complete stock of the goods is carried, and where Western buyers can have their orders filled at factory prices. The goods thus represented consist of Colton's Patent Vise, Re-enforced Sash Chain, Phoenix Door Springs, Door Checks, &c., Window Cleaners, Carpet Stretchers, &c.

The price list issued March 7 by E. C. Meacham Arms Company, St. Louis, Mo., is printed on exceptionally good paper, and represents a line of Rifles, Guns, Revolvers, &c., Roller Skates, Bicycles, &c. It has the usual key to the quotations, which are given in cipher.

The Coventry Machinists' Company, Coventry, England, with a branch house 239 Columbus avenue, Boston, have issued an illustrated catalogue of the Club Bicycles and Tricycles. It describes an interesting variety of these machines, and gives a number of testimonials from those who are familiar with them. The sundry department represents an assortment of Lamps, Saddles, Alarms, Cyclometers, Whistles, &c.

Enterprise Mfg. Company, Philadelphia, Pa., for whom J. C. McCarty & Co. are agents, 97 Chambers street, New York, have issued their catalogue for 1889, which represents their varied line. The pamphlet opens with the Enterprise Lawn Mower '89, which is followed by their Lawn Mower '87. Sad Irons, Coffee, Spice and Drug Mills, Measuring Faucets, Tobacco Cutters, Meat Choppers, Cork Pullers, Cherry Stoners and other goods follow.

Among the special notices on page 48 is one in which a business long established in a city of 20,000 inhabitants and having natural gas is offered for sale. The amount of the stock is put at \$8000 and the annual sales \$40,000. An interest in the business will be retained if desired. This

is referred to as a favorable opportunity to acquire a valuable business without bonus.

S. B. McCord and Basche & Co., Baker City, Ore., the two Hardware houses in that city, have both fitted up their buildings, and are now in good shape for the coming season's business. The outlook for trade is referred to as very favorable.

The Yale & Towne Mfg. Company,

Stamford, Conn., and 62 Reade street, New York, have issued their catalogue No. 12, a large volume of nearly 600 pages, describing the manufactures of the Yale Lock Mfg. Company and the Weston Crane Company, the larger portion of the volume being devoted to the products of the Yale Lock Mfg. Company, and representing their very extensive line of Locks, Door Furniture, Post-Office Equipments, &c. The volume is divided into the following departments: Yale Locks, Yale Master Key Duplex Locks, Standard Locks, Keys, Lock Furniture and Real Bronze Hardware, Prison Locks and Equipments, Time Combination Bank and Safe Locks, &c., Post-Office Equipments, Letter-Boxes, &c., and Hoists. Comparing the catalogue with the former one of the company, it is found that many important additions have been made to the line of Locks to adapt them to special requirements. The line of Yale Master Key Duplex Locks will be regarded with especial interest as new, and solving the difficult problem of giving an unlimited number of Locks of which the change keys may be all different, and yet one master key fitted to the whole number. The line of Standard Locks has also been greatly increased, and includes a very complete assortment, from which architects or the trade can find patterns adapted to nearly every purpose, and at moderate prices. An interesting line of Real Bronze, Brass, Wrought-Iron or Cast-Iron Strap Hinges, Number Plates, Wrought-Iron Grilles, &c., is exhibited, beginning with page 418, and the volume illustrates as far as a catalogue of this character properly can the company's line of Bronzed, Brass and Bower-Barffed Iron Hardware. The company have, however, we understand, many other unique and special designs in these lines which it is not feasible to illustrate in a catalogue of this kind, but which they are prepared to bring to the attention of architects who may desire them, while they are also in a position to manufacture advantageously any special designs that may be called for. It will, of course, be understood that the best designs are special and cannot be reproduced and are changing from day to day. The company advise us that many of their goods can now be furnished with the exposed parts in trimmings in iron or steel with the Bower-Barff rustless finish. After an experience of several years with this finish and having fitted up a number of important buildings with it throughout and having used it under most trying conditions, the company confidently recommend it as the most desirable for public buildings and for use on outside doors in all situations, and indeed for any situation where a beautiful and changeless finish is desired without the necessity of attention after the goods are put on. Every department in the book seems to contain interesting additions, among which special attention may be directed to the Seamless Steel Shell Padlock, which is referred to as possessing advantages for many purposes not possessed by other goods. In this catalogue prices are in all cases omitted, blanks being left for their insertion when desired. A price-list accompanying the volume is also issued, which contains the prices at which the goods are retailed over the counter at their several warehouses, with blank columns for

the insertion of the net prices at which the goods are sold to the trade. The company announce that hereafter they will in all cases quote net prices, having abandoned their system of list and discount.

Business Methods.

We give below a form of remittance and receipt which is used by the Low Moor Iron Company, of Virginia, in their office, 31 Burling Slip, New York. It is used in remitting to parties for goods bought, payments by check or cash being accompanied by this voucher and returned signed by the party to whom the payment is made. At the end of each month these are filed together and form a complete record of the payments for that month.

stored with agreeable and humorous reminiscences of the times when Cincinnati was nothing more than a flourishing Ohio River town, struggling in friendly rivalry with Madison, which was then the leading city of Indiana. Mr. Sonntag has two brothers living—Mr. William Sonntag, of New York, who is one of the most distinguished of American painters, and Mr. John H. Sonntag, a well-known citizen of Evansville. As a man of business, methodical and correct in all commercial transactions, George S. Sonntag's reputation in this community has been so long established and well sustained that it is unnecessary to speak of it further than to say that it was without a blemish. Until ill health laid its withering hand upon him George Sonntag was the most companionable of men, always welcome in the choicest coteries of congenial natures, and lending to the entertainment a quality of humor that was unlike any of the others in its quaint originality and hearty, gen-

PLEASE RETURN THIS RECEIPT, TO 31 BURLING SLIP, N. Y.

The Low Moor Iron Company of Virginia,

To *Jno. Jones & Co.,*

Drs.

March 5	\$16.50 — .17	\$16	35
" 7	41.00 — .31	40	79
" 13		85	
		82	18

Received \$ *88.18* on above account.

New Haven, March 10, 1889.

Signed, *Jno. Jones & Co.*

In case discount or deduction is made it is noted as indicated in the form. This system has been in use some eight years, and has been largely adopted since by parties who have tested its utility. Its chief merits are referred to as being its brevity, the fact that it requires no letter of advice or acknowledgment and that the blanks are made of uniform size and small, their size being $7\frac{1}{2} \times 3\frac{1}{4}$ inches.

Obituary.

Wm. Henry & Co., wholesale Hardware merchants, Fort Worth, Tex., announce the death of their senior, Col. Wm. Henry, Jr., which occurred on the 16th inst. We are advised that the firm's business will be carried on without interruption.

Geo. S. Sonntag, member of the house of Geo. S. Sonntag & Co., Evansville, Ind., who have been in the Hardware business for upward of 35 years, died on the 12th inst. The estimation in which he was held is evidenced by the following extracts from the tribute which was paid to him in the *Daily Courier*, 13th inst.:

George S. Sonntag was a man of unusually distinguished presence, having about him at all times, whether in business affairs or in the social circle, the air of a man who had been fortunate in birth and associations. His grandfather, William Sonntag, was a Philadelphia merchant of great wealth and prominence nearly a century ago. He was an original claimant under what is known as the French Spoliation, his ships having been among those that were seized and confiscated by French cruisers during the war of 1812. An uncle of George S. Sonntag, and the one for whom he was named, was a sea captain and went to Russia many years ago, entered the naval service of that country and became a rear admiral in the Russian navy. He was one of the largest land owners in Southern Russia, and when his nephew and namesake was entering manhood, the old admiral invited him to come to Russia and cast his fortunes with him. But there were too many ties that bound George Sonntag to his native country. He was born in Cincinnati, Ohio, and finished his education in Woodward High School, the Hon. George H. Pendleton, the present Minister to Germany, having been one of his schoolmates and comrades.

It was always a pleasure to him to recall those youthful days, and his memory was

erous mood. His love for the bright side of all of the phases of life and his appreciation of whatever had a trace of humor in it never forsook him until health gave way.

Show Window Decoration.

The following remarks upon a subject which is receiving considerable attention at the hands of the retail stove and hardware trade of the country, we take from a recent issue of the *American Storekeeper*:

Window-dressing has become a leading feature in the business of retail merchants in all lines of trade. It is looked upon by most storekeepers as a useful art, yet all things which are useful are not cultivated, and there are many, far too many, stores throughout the country where no attention is paid to the decoration of windows; the smoky, dusty sheets of glass remain the same from season to season, and, as an almost universal rule, the trade total remains unincreased. So far as a somewhat extensive experience in mercantile matters has gone, no case has been observed in which window-dressing did not pay in a degree corresponding to the attention devoted to it. This has been the universal testimony of all business men who have ever expressed themselves on the subject, and the number of merchants who are paying more attention to this important subject is constantly increasing.

One reason why this art is not more freely cultivated may be because most storekeepers are men with a lack of an acute perception of the harmony of design and color which has caused them to avoid the decoration of their windows lest some offense to good taste might be perpetrated. Others are negligent because they find no time to devote to that part of business. At any rate, this journal hopes to convince every storekeeper who does not dress his windows that it is not a difficult thing to accomplish; also to extend to such storekeepers, as well as to those who have been practicing window decoration, such information as will enable them to produce good results with a modest outlay of thought, time and, especially, money.

To clerks seeking advancement in mercantile life, no surer passport to success is

to be found than to be an expert window-dresser. There is a dearth of clerks, even among women, who are able to lay out an intelligent plot for a window, and then follow it out completely. It has seemed to be the desire of most writers on the subject in the trade press to impress their readers with the idea that window-dressing is a most complex and laborious operation, difficult to acquire and necessitating the possession of great artistic ability and a creative brain. It may be that this course has discouraged clerks from making a beginning. If so, let the idea be dispelled. Any clerk who has wit enough to sell goods can certainly train himself to be a good window-dresser, particularly if helped along by rudimentary suggestions. A few words on the aims to be sought after in window decoration will give a better understanding of the benefits to be expected and the methods to be employed.

A decorated window must have three principal objects:

1. To serve as an index to the class of goods kept in the store.
2. To attract attention of people to the store.
3. To show goods which will excite in the people the desire of possession.

The first object for which windows should be decorated to serve as indices of goods kept in stock, is simply an advertisement, and must be so considered. It should be made to supplement advertising in the local papers, over which it has the advantage of presenting the object advertised directly to the purchaser, while in a newspaper the object may only be described. Advertising by window-dressing is very effective and costs nothing. A clerk's time is the only requisite, unless the merchant prefers to expend some money—wisely, too—for fixtures specially designed for the purpose. In a newspaper advertisement the merchant announces the articles he desires to sell. The purchaser reads the advertisement and starts on a shopping expedition with an intention of calling in to see the article advertised. If this is displayed in the window the customer is more apt to follow out the original intention of purchasing, and the sale is made more certain. That a customer may see, before purchasing, just the effect produced by combinations as artistically arranged in windows, is often a great aid to selection. The window advertisement goes constantly before hundreds of people who do not read papers, and is a standing invitation to people to purchase your goods.

The second object for which windows are dressed—to attract attention to the store—may seem to be inseparable from an advertisement, but it is that and something more. An advertisement simply announces that you have goods of a certain kind to sell. The window display does the same thing, but it also stimulates curiosity and excites examination and scrutiny of the objects displayed. Persons who have in mind the future purchase of certain articles, will invariably examine goods of the character desired, when displayed in windows which they may be passing. An article appeals more certainly to the taste of a buyer if it is harmoniously displayed. There is no doubt that taste in dress and decoration has been freely cultivated by good window-dressing. A writer has said: "To see just how a purchase is going to look in the home or on the person; to know how to place a vase, easel, picture, or a statuette so the best effect will be secured; to know just what shade of table-cover will best display the prettiness of knick-knacks placed upon it, or how to drape a fabric to the best advantage, are matters which window-dressing helps to decide. That purchase follows close upon decision is a logical certainty. But more than this, an artistic display in a window creates wants which sooner or later end in

purchases which otherwise might never have been made." Windows permit persons who are unfamiliar with prevailing fashions to learn what articles are being used without exposing their ignorance of styles to salesmen. These persons then become easier buyers.

The third object which windows should serve is to excite the desire of possession and induce purchases. The attractively dressed window is a silent salesman appealing for trade. Goods should be so displayed as to force people to feel that they would really like to possess them, and this feeling ends sooner or later in purchases. The result will be an instant sale to people able to gratify their desires; but those who have to plan and contrive before investing the store will be remembered and the goods called for long after they have been taken out of the window; by others the location will be communicated to friends who intend making purchases. In some one of these three ways the window will create business. As it is a constantly changing advertisement the wants of many different people will be catered to and all lines of trade be covered.

Having outlined the objects which should be sought in window-dressing, the merchant will have to use discretion in making his display fit well with his business. The character of the trade he is catering to should be understood; for it would be manifestly unprofitable for a merchant to show only high-priced goods to a trade of which 99 per cent. are unable to buy. It should be borne in mind that the millions use goods of medium quality, while only the hundreds use the finest grades. Hence, it will be wise to display medium-priced goods with exactly the same attention to detail as is used with the better goods. Remember that it is from the millions that most trade comes, and their interests should be served. Following this line of reasoning, the windows in a frontier town will differ very much in their composition from those in a well-settled community. The wants, habits and customs of frontier people are much more pronounced than those in interior towns, and they will stand and appreciate a style of window-dressing which would not be enjoyed in other places.

Another principle to be religiously followed is never to display goods for sale which you do not keep in stock, unless a statement is made to that effect. When the attention of a customer is attracted by a feature in the window, he wants to see the same thing in stock. Substitution is a sin of the first magnitude. If you display a bargain in the window be prepared to duplicate it on the counter. Use every legitimate means to get people into the store, but when they are inside do not deceive them.

The interest of passers-by must be drawn to your window. This may be done in one of three ways: By displaying an immense stock of the same article. Such an arrangement impresses people by its mass and ponderousness, and people will look at it for the same reason they look at a big horse, a large man or a massive block of coal. Americans admire largeness in almost anything. The second manner of attraction is by the peculiar and unlooked-for arrangement of the goods displayed. In this style of window-dressing is the skill of the dresser most to be displayed. In this may be called into use all the artistic feeling and ingenious faculties. To attract attention by mass requires but slight power; to attract it by delicate adjustment of light and shade, by skillful imitations of objects and by happy combination of fabrics, brings into play the dresser's best skill and force. In this division of dressing would be formulated all set pieces, all designs simulating windmills, lighthouses, cradles, ladders, stars, crescents, &c. Their invention can be

multiplied indefinitely by the clever dresser. A third method to attract notice to a window is by the use of means extraneous to the goods kept in stock. In this class might be arranged all mechanical toys, all exhibitions of curious animals, &c. They are very effective, but some merchants look on them as undignified.

After attracting attention to the window the looker-in should have his curiosity gratified by being able to discover the price at which the goods are sold. For this purpose neat price cards are very useful. In this branch of advertising set for your clerks the problem of having the best dressed windows in your town, and then attain your goal if you can.

Exports.

PER BARK N. B. MORRIS, MARCH 4, 1889, FOR MONTIVIDEO, URUGUAY.

By Coombs, Crosby & Eddy.—10 dozen Axes, 25,000 Fish-Hooks, 100 reams Sandpaper, 25 dozen Wheelbarrows, 44 dozen Slates, 55 gross Rubber Goods.

PER BRIG MARENA, MARCH 5, 1889, FOR ROSARIO, ARGENTINE REPUBLIC.

By Higganum Mfg. Company.—77 cases Agricultural Implements.

By A. D. Hitch.—60 dozen Mattocks, 13 dozen Hinges, 42½ dozen Knobs and Cranks, 42½ dozen Wrenches, 27 dozen Wrenches, 24 reams Sand Paper, 241 dozen Sledge Handles, 9 packages Axe Handles, 1 package Faucets, 20 packages Tacks, 1 package Plumbs and Levels, 7 packages Scales, 1 package Spring Balances, 200 pounds Nails, 2 Scales.

By J. H. Snyder.—228 packages Agricultural Implements.

By W. H. Crossman & Bro.—59 dozen Hatchets, 6 dozen Picks, 12 reams Sand Paper, 50 dozen Pick Handles, 50 dozen Axe Handles, 100 dozen Spades, 4 Hay Presses, 15 packages Hay Rakes, 222 Plows, 150 Plowshares.

By Markt & Co.—9 Carbines, 54 Revolvers, 31,500 Cartridges.

By Neuss, Hesselein & Co.—6 Corn Shellers, 6 Corn Mills.

By Emil Rump & Co.—12 dozen Chain, 1955 pounds Sand Paper, 6 cases Ladders, 17 crates Stoves, 17 packages Lamp Goods.

By Lyon & Co.—18 dozen Picks and Mattocks, 2 Harrows, 48 Stove-Pipe Joints, 16 Stove Elbows, 16 Stoves and Parts, 24 Plows, 4 dozen Hatchets.

By J. Norton & Sons.—35 Rakes, 55 packages Bulky and Hay Rakes.

BY BARK SCOTS BAY, MARCH 18, 1889, FOR MONTEVIDEO, URUGUAY.

By J. B. Woodward.—225 Sewing Machines, 1170 Plows and Repairs, 70 Corn Shellers.

By A. D. Hitch.—4 dozen Bush Hooks.

By Smith, Lyon & Co.—13 Plows and Extras, 2 Harrows.

By Stevens, Corwin & Co.—127 Clocks, 68 dozen Hay Forks, 118 reams Sand Paper, 1 cask Lamp Goods, 9 packages Hardware, 18 dozen Shovels, 4 casks Lamp Goods, 2 packages Lamp Goods, 42 packages Hardware.

By Waterbury Clock Company.—21 cases Clocks.

By E. Miller & Co.—44 packages Lamp Goods, 14 packages Lamp Goods, 27 packages Lamp Goods.

By W. E. Peck.—12 packages Hardware, 96 Plows.

BY BARK CELINA, MARCH 20, 1889, FOR LAUNCESTON, TASMANIA.

By H. W. Peabody & Co.—728 packages Hardware, 300 pounds Stone, 7 cases Shade Rollers, 13½ gross Grease, 15,680 pounds Barb Wire, 2780 doz. Handles, 26 packages Stoves, 15 cases Lampware, 6 dozen Firearms, 21 cases Agricultural Implements, 63 cases Fiber-Ware, 9 bundles Step-Ladders, 425 dozen Brooms, 1552 pounds Nails, 75 Churns, 29 cases Perambulators, 2 dozen Clocks, 2 cases Lawn Mowers, 1 case Trucks, 1 case Blocks, 2 cases Pumps, 17 packages Windmills, 50 bundles Washboards, 3900 pounds Nails, 12 dozen Shade Rollers, 5 cases Hardware, 9 cases Clocks, 3 cases Springs, 5 packages Axes and Wheels, 1 case Hydraulic Machinery, 4 dozen Garden Sets, 6 dozen Wringers, 25 bundles Tubs.

PER SHIP WARRIOR, MARCH 22, 1889, FOR MELBOURNE, AUSTRALIA.

By Arkell & Douglas.—½ dozen Spoke Trimmers, 2 dozen Augers, 850 pounds Castings, 22 sets Hubs, 1280 Spokes, 4 cases Castings, 523 pounds Bolts, 697 pounds Castings, 1 case

Lawn Sprinklers, 1 gross Glue, 1 case Lead Pencils, 11 cases Axes, 1 dozen Wire Goods, 2 cases Saws, 2500 Broom Handles, 9 cases Fruit Jars, 1 case Hardware, 9 dozen Hammers, 1 case Wire Goods, 1 case Latches, 10 dozen Axes, 2 gross Axle Grease, 560 pounds Axle Grease, 12 dozen Hammers, 18 dozen Locks, 12 dozen Gate Hinges, 6 dozen Hardware, 2 cases Wood Spoons, 50 gross Wicks, 1 case Bolts, 15 cases Axes, 9 cases Forges, 1 case Bolts and Nuts, 10 cases Bolts, 1 case Brackets, 1 case Wire Goods, 1 case Nails, 450 pounds Rivets, 2 cases Hardware, 2 cases Hubs, 1 case Guns, 3 dozen Fry Pans.

By McCoy & Sanders.—1 case Hardware.

By W. H. Crossman & Bro.—2 cases Boring Machines, 1 case Hardware, 6 dozen Burners, 6 dozen Braces, 1 gross Mouse Traps, 5½ dozen Wringers, 1 dozen Sad Irons, 1 case Hardware, 350 pounds Rubber Packing, 2 dozen Stocks and Dies, 60 pairs Tongs, 1 gross Valves, ¼ dozen Graters, 1 1-6 gross Fish Lines, 3 dozen Oilers, 2 dozen Sifters, 1 case Hardware, 3 dozen Match Safes, 1½ gross Spoons, 3 dozen Rolling Pins, 1 box Pails, 13 dozen Braces, 1 dozen Tire Gauges, 4 dozen Screw-Drivers, 3 cases Hardware, 10 packages Hardware, 2 dozen Grindstone Fixtures.

By R. W. Forbes & Son.—2 dozen Clothes Wringers, 8 gross Fruit Jars, 5 gross Axle Grease, 11 dozen Clothes Wringers, 14 packages Lampware, 20 packages Hardware, 900 Nails, 2400 pounds Carriage Bolts, 9 packages Hardware, 60 sets Hubs, 1 case Hardware, 5 dozen Clocks, 14 cases Hardware, 26 dozen Hatchets, 53 dozen Axe Handles, 4 dozen Bench Screws, 13 cases Hardware, 3 dozen Rifles, 12 dozen Axle Grease.

By Winchester Repeating Arms Company.—62 Guns, 70 sets Tools, 110,000 Primers, 20,000 Metallic Cartridges, 17,000 Metallic Cartridges, 50,000 Paper Shells, 24 Rifles, 26,000 Metallic Cartridges, 70,000 Primers, 55,000 Paper Shells, 35,000 Cartridges, 650 pounds Cartridges, 10,000 Paper Shells, 25 Guns, 8000 Cartridges, 7000 Shells, 18 Guns, 30,000 Primers, 20,000 Shells.

By Crane & McMahon.—10 bundles Crowbars.

By Coombs, Crosby & Eddy.—3053 pounds Machinery and Castings, 100 boxes Clothes Pins, 4 dozen Lamp Goods.

By Welsh & Lea.—8 packages Axes, 4 cases Hardware, 3 cases Saws, 2 cases Hardware, 1 case Hardware, 1 case Handles.

By H. W. Peabody & Co.—24,000 feet Fuse, 11 cases Type-writers.

By Edward Miller & Co.—23 packages Lampware.

By R. W. Cameron & Co.—44 cases Handles, 8 cases Hardware, 11 cases Handles.

By Strong & Trowbridge.—3 cases Hatchets, 1 case Axle Grease, 3 cases Axe Handles, 1 case Wringers, 1 case Brooms, 1 package Clothes Pins, 1 case Harness Polish, 1 case Springs and Axes, 1 case Nails, 2 cases Spokes, 1 case Hardware, 1 case Spokes, 1 case Hardware.

By A. Field & Co.—95 dozen Whip Handles, 24 dozen Harness-Ware, 12 dozen Whip Handles, 4 cases Harness Goods, 300 dozen Whip Handles, 124 dozen Harness-Ware, 12 gross Whips.

By Mailer & Quereau.—65,005 pieces Roofing Slate, 230 dozen Axes, 360 dozen Handles, 3 packages Iron Castings.

By Morris, Strouse & Co.—14 dozen Hatchets, 16 dozen Axes, 24 dozen Hammers, 1225 pairs Skates, 3 dozen Wringers, 4 gross Sewing Machine Oil, 1 gross Wood Handles, 152 dozen Rules, 48 dozen Gate Latches, 17 dozen Hardware, 29 dozen Iron Stands, 2 cases Hardware, 2 dozen Hatchets, 72 dozen Tacks, 2 gross Egg Beaters, 3 gross Mucilage.

By McLean Bros. & Rigg.—1 dozen Card Knives, 12 Scales, 12½ gross Axle Grease, 9 dozen Saw Sets, 6 dozen Bench Stops, 12,800 Bolts, 130 dozen Axes, 12 Guns, 40,000 Primers, 20,000 Paper Shells, 20,000 Loaded Shells, 30 packages Belt Studs, 36 dozen Hammers, 9 cases Pulleys, &c.; 900 pounds Nails, ¼ dozen sets Sad Irons, 5 Scales, 7 dozen Augers, 7 cases Brackets, &c.; 6000 feet Hose, 3500 pounds Nails, 3 cases Agate Ware, 40 kegs Nails, 84 dozen Handles, 15 dozen Barrows, 130 dozen Axes.

By New Haven Clock Company.—18 Clocks, 940 Clocks.

By Meriden Britannia Company.—2 packages Plated-Ware.

By Lalance & Grosjean Mfg. Company.—1080 pounds Household Utensils.

By E. N. Welch Mfg. Company.—1 box Clocks.

By Healy & Earl.—2 boxes Scales, 1 box Emery Machinery, 1 box Emery-Wheels.

By W. K. Freeman.—90 dozen Axe Handles, 6000 Loaded Shells.

By F. B. Wheeler & Co.—82 Velocipedes, 6 dozen Hammers.

By H. Behr & Co.—3 cases Sandpaper.

By John A. Gifford.—1 case Springs

By Singer Mfg. Company.—113 cases Sewing Machine Oil.

By Simpson, Hall, Miller & Co.—930 pounds Plated-Ware.

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New Butchers' Tools.

Robert Murray, 24 Duane street, New York, is putting on the market the solid cast-steel splitting knives and cleavers

different uses indicated in its name. The efficiency of its operation for these different uses is pointed out. It is made entirely of malleable iron, and finished in Vienna bronzed lacquer. It is also pointed out

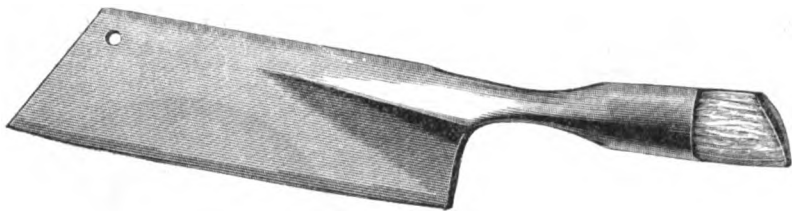


Fig. 1.—Solid Cast-Steel Splitting Knives.

which are here represented, for the sale of which he is sole agent. The socket splitting knife is made in 10 and 12 inch sizes. The cleavers shown in Fig. 2 are

by the manufacturers that it will serve as a stove-lid lifter and a pair of pinchers.

Triumph Halter Chains.

The Bridgeport Chain Company, Bridgeport, Conn., are making a line of Triumph Halter Chains, the form of link being represented in the accompanying illustra-

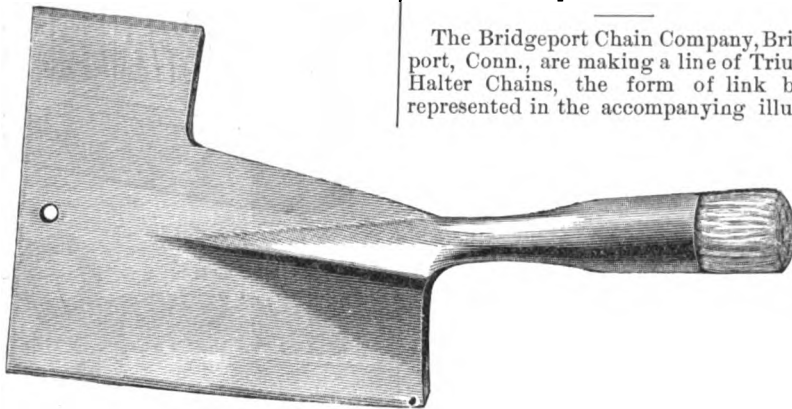


Fig. 2.—Solid Cast-Steel Cleavers.

made either double bit or single bit, in 7, 8, 9, 10, 11 and 12 inch sizes.

A New Combination Tool.

The Wire Washboard Company, Canton, Ohio, are manufacturing the Champion Combined Tack Hammer, Setter and

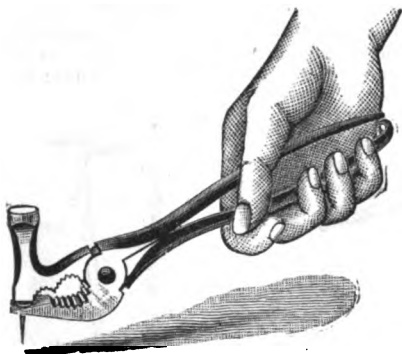


Fig. 1.—Combination Tool as Tack Setter.

Pipe Wrench, which is represented in the accompanying illustrations, Fig. 1 showing it as a tack setter and Fig. 2 as a gas

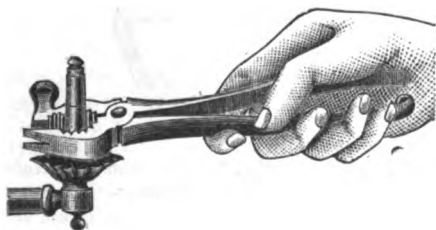


Fig. 2.—Combination Tool as a Gas Burner and Pipe Wrench.

fixture and pipe wrench. From these illustrations it will be seen that it is so constructed as to be adapted to the three

tion. They are described as made of steel throughout and possessing great tensile strength, while they are much lighter in weight than the flat sheet-metal chains or



Triumph Halter Chain.

the welded chains. The point is also made that they have no sharp edges and do not kink, while as there are no welds additional security is obtained. They are made in a variety of numbers, $4\frac{1}{2}$ and 6 feet lengths. Coil-chain is also made of the same pattern.

The Boston Athenæum Building has been reconstructed and wire lathing substituted for wood as a precaution against fire.

Abbe's Patent Sash-Cord Fastener.

The accompanying illustrations, Figs. 1 and 2, represent a new device which is manufactured by Edwin W. Abbe, New Britain, Conn. It is intended, as the name and illustrations indicate, for fastening braided and all hard laid cords to the sash and weights without tying knots. As will be seen by these illustrations, the cord passes down through the opening

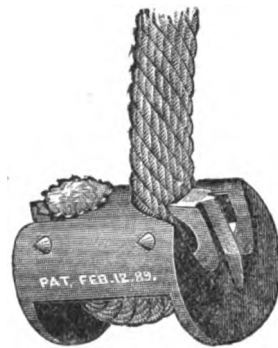


Fig. 1.—Abbe's Patent Sash-Cord Fastener.

in one end of the fastener and up through the opening in the other end, when the spurs or points in both ends are driven in so as to hold the cord securely. The point is made that this fastener can be applied in much less time than it takes to unbraid and tie a knot in the old cord iron, and that its use saves cord. The two points on top which by the weight of the sash are drawn into the wood are referred to as keeping it from working against the casing. These sash-cord fast-

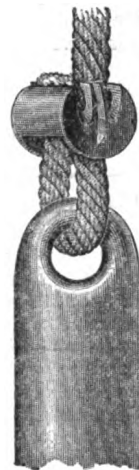


Fig. 2.—Sash-Cord Fastener with Sash Weight.

eners are manufactured in two sizes. No. 1 is the most commonly used and takes Nos. 7 and 8 cord, while No. 2 takes No. 9 and No. 10.

The new State of Washington is being equipped with railroads. The recently formed Spokane Falls and Northern Railway Company, who are going to construct a standard gauge road 175 miles long from Spokane Falls to the Columbia River, will have officers from this city and Brooklyn. J. K. O. Sherwood has been elected president, and Mayor Alfred C. Chapin, of Brooklyn, treasurer. The capital of the company is about \$7,000,000. The new road will connect at Spokane Falls with the Northern Pacific, and by boat to Revelstroke with the Canadian Pacific. The road will open up valuable timber and coal regions. A contract to build the entire road has been made with D. C. Corbin, brother of Austin Corbin

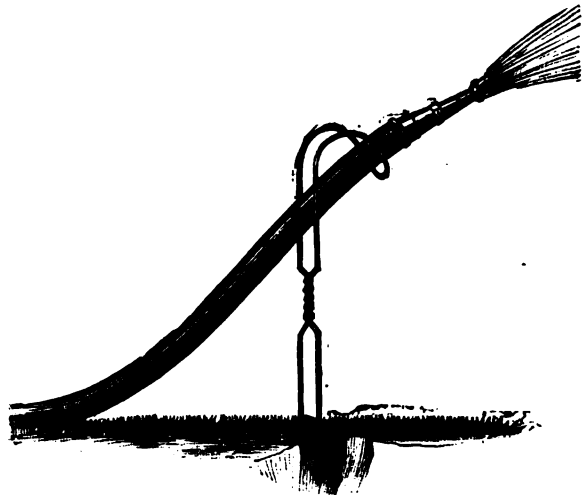
Little Gem Adjustable Hose Holder.

This article is manufactured by the Gibbs Lawn Rake Company, Canton, Ohio, for whom John H. Graham & Co., 118 Chambers street, New York, are general agents. The illustration herewith given represents it in use. It is described as made of No. 10 spring steel wire, heavily tinned, making it neat in appearance and preventing rusting. The hose, when placed in the holder, is held firmly

factory, is practically solid and of standard size, and which can be placed in a collet, plate, or chuck any number of times, and always cut the same size until wear takes place, which can readily be compensated for in the manner shown.

The Gem Post-Hole Auger.

J. H. Osborne & Co., Union City, Ind., are putting on the market the above-named article, which is represented in the



Little Gem Adjustable Hose Holder.

and can be quickly adjusted, the manufacturers making the point that no thumb nuts or other annoying contrivances are embodied in its construction. It is also pointed out that the holder can be readily changed from place to place without shutting off the water before approaching it. The convenience of the holder in watering small lawns or narrow strips of grass and the low price at which it is offered are also referred to.

New Adjustment for Dies.

The illustration shows a new threading die brought out by J. M. Carpenter, Pawtucket, R. I., the special feature of which consists in the insertion of a taper pin into a hole reamed for its reception in the slot or opening and intended to serve the purpose of the more costly collet or collar in which such dies are usually placed. These dies are so made as to have a tendency to spring together or close up the opening, which makes them grasp the pin firmly. When worn large, it is only necessary to



New Threading Die.

drive the pin out slightly, when the die closes. After properly adjusting the size, the projecting end of the pin can be smoothed off. Should the two parts of the dies be sprung sidewise in hardening, the insertion of the pin restores them to their proper places, making the threads match as before. By this means the advantages of a solid die are secured, and yet it can readily be adjusted. Neither is it necessary to readjust it each time it is placed in the stock or holder. It will thus be seen that by this simple device a die is provided which, when it leaves the

accompanying illustrations, Fig. 1 showing it open for dumping and Fig. 2 showing the blades closed for the removal of fine dirt after it has been inserted in the ground. It will be perceived the opening and closing of the blades is accomplished without removing the hands from the handles, there being no latches or springs in their construction. The manufacturers claim that this is the only post-hole auger having blades so shaped as to permit them to close tightly at the points, thus retaining the finest dirt or sand. The peculiar shape of these blades has been patented. The auger is described as made almost entirely of steel and is referred to as very strong, the leverage extending clear to the

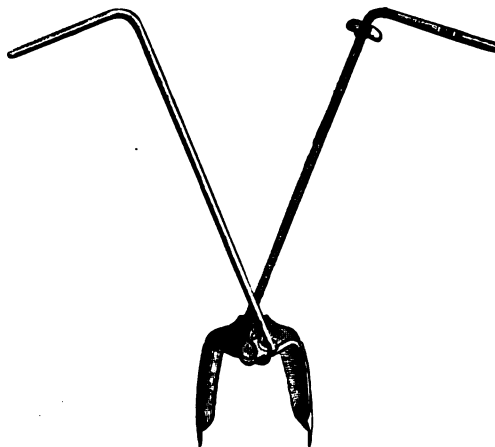


Fig. 1.—The Gem Post-Hole Digger—Opened.

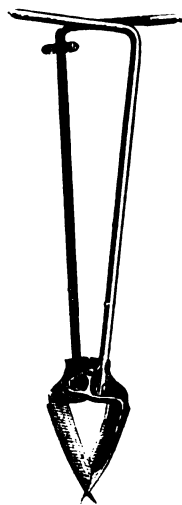


Fig. 2.—The Gem Post-Hole Digger—Closed.

cutting blades. The ease and efficiency of its operation, as well as its substantial construction, are also pointed out.

Detroit expects to have a permanent exhibition, \$247,000 of the \$300,000 desired for this object having been subscribed. The proposed site is a tract of 70 acres below Fort Wayne.

The Yale Steel-Shell Padlock.

The construction of the Yale bronze padlock is well known, and consists of an outside seamless bronze shell, which incloses the gun-metal block carrying the



The Yale Steel-Shell Padlock.

working parts. When the lock is together, therefore, it is practically a solid block of metal, and gives very great strength against blows or against any crushing strain designed either to open the lock or to interfere with the working of the mechanism. In some situations where the locks are subjected to very severe usage, such as for switch-locks, it has been found desirable to use steel shackles, which are stiffer than the bronze, and also more secure against cutting or other violence. For certain situations these steel

shackles have been found so desirable that the Yale & Towne Mfg. Company have followed this matter still further, and have now ready for the market a padlock with a seamless steel shell as well as a steel shackle. The mechanism of this lock is also carried by a gun-metal block, which gives the lock the same solidity against being crushed as the bronze lock has. It

is proposed to finish the case of the lock by the Bower-Barff process, which will make it rustless. The mechanism is the same as in the bronze lock, so that the lock is offered as possessing very great security against picking, against violence and against the action of the weather. Facilities have been provided for its manufacture, so that despite its high grade the price will be moderate. The list number of the lock is 8454, and it is at present made in only one size, as illustrated.

The Sullivan Cork-Puller.

The illustration herewith given represents a new cork-puller put on the market by James D. Frary, Meriden, Conn., and embodying features for which he is obtaining patents. As will be inferred from the illustration, the corkscrew is inserted in the cork by means of the handle at the top of the puller, when, by raising the lever or principal handle, which, by means of the gears attached to it, is connected with the rack to which corkscrew is attached, the cork is easily extracted. It will be seen that the cork-puller has a clamp attachment for fastening it to the counter or shelf. The screw is described as made of the best cast steel, hardened and tempered.



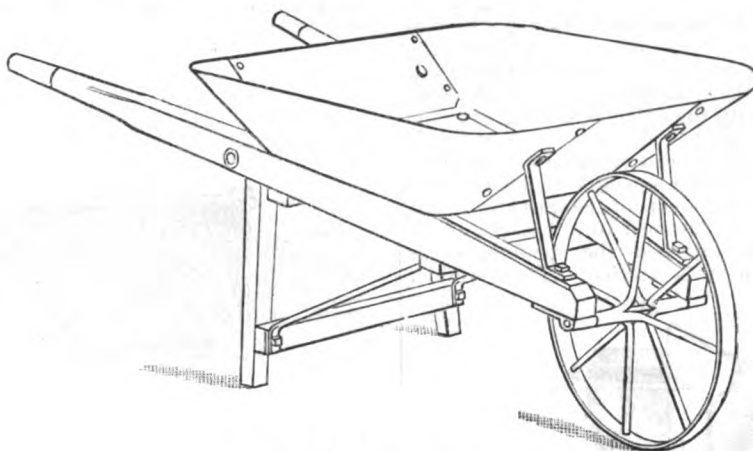
The Sullivan Cork-Puller.

This puller is made in two styles, ornamented in Berlin bronze and nickel-plated. The simplicity and strength of its construction, its ornamental appearance and the efficacy of its working are the points in regard to it which are emphasized by the manufacturer.

Steel Tray Wheelbarrow.

The Sidney Steel Scraper Company, Sidney, Ohio, are manufacturing the wheelbarrow represented in the accompanying illustration. The tray, which is neatly blackened, is made from a single piece of steel bent to shape, and has round corners, thus leaving no place for dirt to stick. Particular attention is directed to

the wheel, which is made of wrought iron. As indicated in the engraving, the inner ends of the spokes are firmly welded to the axle; the other ends are shouldered, permitting them to be securely riveted in the tire. The manufacturers point out that the spokes, hub and axle, being thus welded together, form one solid piece, insuring



Haslup's Steel Tray Wheelbarrow.

great strength. The barrow is described as thoroughly braced and attractive in appearance, the frame being made of good lumber, planed smooth and well painted. All parts are bolted together, making it very easy to set up, and the manufacturers allude to it as being lighter than an all-wood barrow.

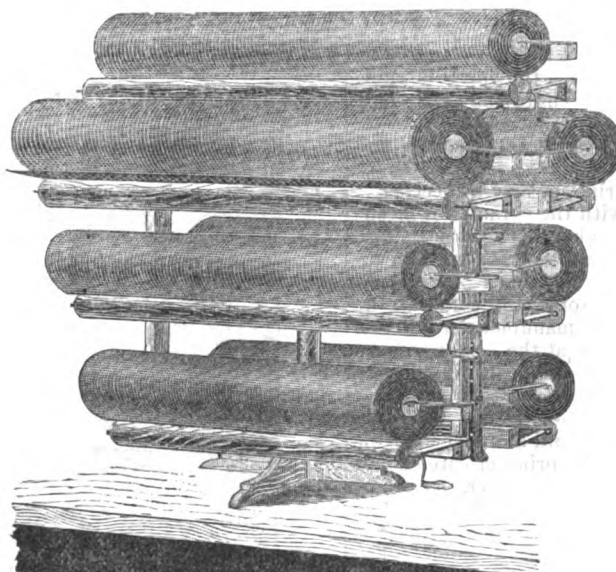
The Ehman & Simon Wood Mantels.

Wood mantels are now regularly carried in stock by many hardware merchants all over the country. Prominent among the establishments giving special attention to this branch of trade are the Ehman & Simon Mfg. Company, whose factory is at

ing the demands of the people whose æsthetic tastes have been found worth cultivating in this line as well as in others. From 80 to 100 hands are employed in this establishment and shipments of goods are made all over the country, from Portland, Me., to Portland, Ore., to points in Florida, and to Galveston, Tex. No catalogue is issued, as the designs are constantly changing, but photographs are made whenever deemed necessary or desirable.

American Screen Wire Holder.

This article, patented April 17, 1888, is manufactured by John Hosford, Monroe-



American Screen Wire Holder.

the corner of Elizabeth and Fulton streets, Chicago. They make a very large line of mantels and over-mantels in either stock patterns or special designs. They occupy a brick building whose dimensions are 50 x 140 feet, four stories high, devoted entirely to their own purposes. The lumber in the rough is received on the first floor, where it is dressed and cut to size. Carving is done on the second floor, joining on the third floor, and finishing on the fourth floor. The second floor also contains a drafting-room and a sample-room. In the latter a large line of samples is carried,

ville, Ohio, and is represented in the illustration given above. As thus shown, it will be seen that this is a construction for holding rolls of wire cloth of different widths, having accommodations for seven rolls. The point is made that there is no difficulty in putting the rolls in place, and that when the holder is full a fine display is secured. The moderate price at which it is offered is also alluded to as further commending it to the attention of the trade. The convenience and utility of the holder are referred to in some testimonials which are furnished.

Self-Acting Sprinkler.

A. J. Lane, of Glenville, Ohio, is offering the trade a self-acting potato-bug sprinkler, a general view of which is afforded by means of the engraving presented herewith. The sprinkler consists essentially of a cylinder $8\frac{1}{2}$ inches in diameter and 24 inches high, having a funnel-shaped top so constructed that the sprinkler may be easily filled with liquid. Within the cylinder is an agitator connected with the lever extending over the left shoulder of the operator. A string is attached to the end of the lever which is employed by the operator to occasionally agitate the contents of the sprinkler. The cylinder is fastened to a back-board, to which is attached the shoulder straps by which it is carried. The sprinkler



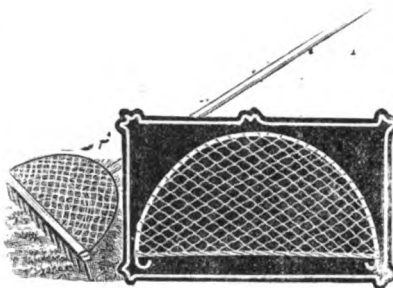
Lane's Self-Acting Sprinkler.

holds 5 gallons and weighs when full about 40 pounds. The nozzle is made entirely of brass and is constructed with a valve at the end so placed as to prevent any loss of liquid when the valve is shut. An inspection of the engraving will show the manner in which this valve operates. The nozzle is of simple construction and may be taken apart for the purpose of cleaning or repairing, as may be necessary. It is connected with the cylinder by means of a piece of rubber hose. The construction of the sprinkler is such that its contents cannot spill over, while the back-board tends to prevent the operator taking cold. To the latter feature the manufacturer directs special attention, as at the season of the year when these sprinklers are likely to be employed the operator is lightly clad and without some protection would be likely to be chilled by the cold cylinder upon his back. In using this sprinkler care should be taken to have clean water, as otherwise the nozzle may become clogged. The proportion of Paris green employed is one tablespoonful to 5 gallons of water. The device is said to be very satisfactory in operation, and to prove a sure method of exterminating bugs and insects on potato, cotton and tobacco plants. The maker states that it can also be satisfactorily employed for cleaning carriages and watering plants and flowers.

Rake Cap.

This article is manufactured by the Rake Cap Company, Bridgeport, Conn., and illustrated herewith, the cut giving a view of the cap unapplied and also attached to the rake. The caps are made of galvanized-wire netting, and are firmly and neatly put together. They are readily attached to any garden, lawn or hay rake, and are very durable. Two

sizes are made, a large one for wooden rakes and a smaller one for garden rakes. The former is hooked or fastened over the head of the rake, while the latter is hooked under the head. A staple may be used to secure the semi-circular rod at the point where it rests on the rake handle, thus holding the cap firmly. The manufacturers emphasize the value of this cap in

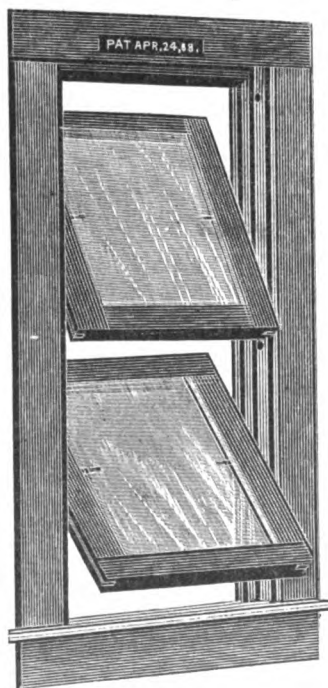


Rake Cap.

raking, in that it prevents leaves, sticks, grass, &c., from escaping over the rake head, referring also to the low price at which it is offered.

Peerless Reversible Window.

In the engraving presented herewith we show a general view of the Peerless Reversible Window which is being introduced to the trade by Edgerton & Metcalf, of No. 120 Twenty-second street, Chicago, Ill. The form of construction employed is such that the window may not only be raised and lowered in the ordinary manner, but it may be reversed without difficulty, bringing either side of top and bottom sash within convenient reach of a person standing on the floor. Inserted edgewise in grooves in the stiles of the window is a clamping plate which extends from top to bottom of the sash. This plate is provided with rounded projections and slots at the top, center and



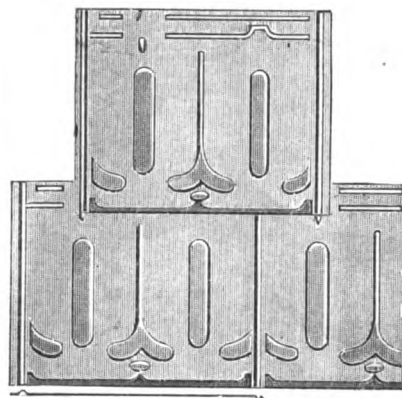
Peerless Reversible Window.

bottom, through which pass spindles or bearing pins. The center spindle carries an eccentrically mounted cam roller, by means of which the plate referred to may be moved in or out of the grooves in the window stiles something after the manner of an ordinary lock. Midway from top to

bottom of the sash a sleeve is inserted through the stiles at each side of the window for the reception of a spring bolt or catch which locks the window in place or, when the plate above referred to is withdrawn from the jamb, allows the window to be revolved as on a pivot. The groove for the sash cord instead of being in the stiles, as is ordinarily the case, is formed in the jamb or frame inclosing the window proper. The cord plate forms a pivotal connection between the sash cord and the window, so that no matter what the position of the window may be, the cord remains relatively the same. The projections at top and bottom of the clamping plate fit the grooves for the sash cord in such a manner as to prevent the window from rattling, at the same time maintaining a tension that permits the window to easily move up and down. When the window is to be placed in position, the clamping plate is drawn into the stiles by turning with a key the spindles upon which is mounted the cam roller. The perforated end of the cord-plate is then slipped over the inner end of the sleeve, when the window may be set in place. By turning the spindles in the opposite direction one edge of the clamping plate is partially thrown into the cord groove in the jamb and, as the plate advances, the projections or lugs, at top and bottom, are forced into place.

New Design Metallic Shingle.

The Cincinnati Stamping Company, of Cincinnati, Ohio, are introducing to the building trade some new design



New Design Metallic Shingle, Showing Size of Shingle, Method of Joining and Position of Joints.

metallic shingles, a general view of which is afforded by means of the engraving presented herewith. The shingles are stamped from 10 x 14 inch tin plate, and when laid have very much the appearance of 7 x 10 shingles. The lock employed is the same as that which the company use in connection with their other shingles, many thousands of squares of which are said to have been placed upon buildings scattered through the country. By reference to the engravings, the reader will be able to gather a very clear idea of the manner in which the shingles are put together, the position of the joints and the form of lock employed.

A cargo of bones from Alexandria, Egypt, which was delivered in Brooklyn last week for fertilizing purposes, was gathered from the Desert and comprises bones from all parts of the human frame as well as those of beasts. The mines are practically inexhaustible, and are being worked by German speculators.

CURRENT HARDWARE PRICES.

MARCH 27, 1889.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers, at the figures named.

Ammunition.—

Caps, Percussion, "u 1000—	
Hicks & Goldmark's	
F. L. Waterproof, 1-10's.....	50¢
E. B. Trimmied Edge, 1-10's.....	85¢
E. B. Grind. Edge, Cent. Fire, 25 & 1-10's.....	75¢
Double Waterproof, 1-10's.....	\$1.40
Musket Waterproof, 1-10's.....	50¢
G. D.....	25¢
S. B.....	30¢
Union Metallic Cartridge Co.	
F. C. Trimmied.....	50¢
F. L. Ground.....	65¢
Cent. Fire Ground.....	70¢
Db. Waterproof.....	75¢
Db. Waterproof, in 1-10's.....	\$1.40
S. B. Genuine Imp.orted.....	45¢
Eley's E. B.....	54¢
Eley's D Waterproof, Central Fire.....	\$1.00
Cartridges.	
Rim Fire Cartridges.....	50¢
Rim Fire Military.....	15¢
Cent. Fire, Pistol and Rifle.....	25¢
Cent. Fire, Military and Sporting.....	15¢
Blank Cartridges, except 22 and 32 cal., additional 10% on above discounts.	
Blank Cartridges, 22 cal.....	\$1.75
Blank Cartridges, 32 cal.....	\$3.50
Primed Shells and Bullets.....	15¢
B. B. Caps, Round Ball.....	\$1.75
B. B. Caps, Con. Ball, Swgd.....	2¢
Primers—	
Berdan Primers.....	\$1.00
B. L. Caps (for Sturtevant Shells).....	\$1.00
All other Primers.....	\$1.20
Shells—	
First quality, 4, 8, 10 and 12 gauge.....	25¢
First quality, 14, 16 and 20 gauge.....	\$1.10
Star, Club, Rival and Climax.....	30¢
10 and 12 gauge.....	35¢
Club, Rival and Climax brands, 14, 16 and 20 gauge.....	30¢
Seibold's Comb. Shot Shells.....	15¢
Brass Shot Shells, 1st quality.....	60¢
Brass Shot Shells, Club, Rival, Climax.....	65¢
I. X. L., 10 and 12 gauge.....	40¢
"Special," 16 gauge.....	30¢
"Special," 10 and 12 gauge.....	40¢
Fowler's Pat.....	\$3.25

Shells Loaded—

A. M. Co. List No. 19, 1887.....	20¢
Wads—	
U. M. C. & W. R. A.—B. E., 11 up.....	\$2.00
U. M. C. & W. R. A.—B. E., 9 & 10.....	2.30
U. M. C. & W. R. A.—B. E., 7 & 8.....	2.60
U. M. C. & W. R. A.—P. E., 11 up.....	8.10
U. M. C. & W. R. A.—P. E., 9 & 10.....	4.00
U. M. C. & W. R. A.—P. E., 7 & 8.....	4.90
Eley's B. E., 11 up.....	\$1.75
Eley's P. E., 11 up.....	2.80

Anvils—

Eagle Anvil, 7 lb 10¢.....	20¢
Peter Wright's.....	34¢
Armstrong's Mouse Hole.....	84¢
Armstrong's Mouse Hole, Extra.....	\$1.11
Trenton.....	94¢
Wilkinson's.....	94¢
J. & Riley Carr, Pat. Solid.....	11¢
Moore & Barnes Mfg. Co.....	33¢
Anvil Vice and Drill—	
Millers Falls Co., \$18.00.....	20¢
Cheney Anvil and Vice.....	25¢
Allen Anvil and Vice.....	40¢

Apple Parers—

Advance.....	47¢
Antrim Combination.....	52¢
Baldwin.....	52¢
Champion.....	72¢
Eureka, 1888.....	17.00
Family Bay State.....	12.00
Gem.....	5.25
Gold Medal.....	4.00
Hudson's New '88.....	3.75
Ideal.....	4.00
Improved Bay State.....	30.00
Little Star.....	5.00
Monarch.....	13.50
New Lightning.....	5.50
Oriole.....	4.00
Penn.....	4.00
Perfection.....	4.00
Pomona.....	4.00
Rocking Table.....	6.00
Turntable.....	4.50
Victor.....	13.50
Waverly.....	4.50
White Mountain.....	4.50
72.....	5.75
78.....	6.50

Augers and Bits—

Douglas Mfg. Co.....	
Wm. A. Ives & Co.....	70¢
Humphreysville Mfg. Co.....	
French, Swift & Co. (F. H. Beecher).....	55¢
Cook's, N. H. Copper Co. 50¢ & 10¢ & 10¢ & 10¢	
Ives' Circular Lip.....	80¢
Patent Solid Head.....	30¢
C. E. Jennings & Co., No. 10, extension.....	40¢
lip.....	40¢
C. E. Jennings & Co., No. 30.....	20¢
C. E. Jennings & Co., Auger Bits, 7 set, 32 1/4 quarters, No. 5, 35; No. 30, \$3.50.....	
Lewis' Patent Single Twist.....	45¢
Jennings' Augers and Bits.....	25¢
Imitation Jennings' Bits.....	90¢
Pugh's Black.....	20¢
Car Bits.....	50¢
L. Hommedieu Car Bits.....	15¢
Forstner Pat. Aug. Bits.....	10¢

Hollow Augers—

Ives'.....	25¢
French, Swift & Co.....	25¢
Douglas.....	40¢
Bonney's Adjustable, 7 dos \$48.....	40¢
Stearns.....	20¢
Ives' Expansive, each \$4.50.....	50¢
Universal Expansive, each \$4.50.....	20¢
Wood's.....	25¢

Expansive Bits—

Clarks' small, \$18; large, \$36.....	35¢
Ives' No. 4, 7 dos \$60.....	40¢
Swan's.....	40¢
Stearns, No. 1, \$25; No. 2, \$22.....	35¢
Stearns' No. 2, \$48.....	20¢

Gimlet Bits—

Common.....	7¢
Diamond.....	10¢
Bee.....	25¢
Double Cut, Shephardson's.....	45¢
Double Cut, C. Valley Mfg. Co.....	30¢
Double Cut, Hartwell's, 7 gro.....	45¢
Double Cut, Douglas.....	40¢
Double Cut, Ives.....	60¢

Bit Stock Drills—

Morse Twist Drills.....	50¢
Standard.....	50¢
Cleveland.....	50¢
Syracuse, for metal.....	50¢
Syracuse, for wood (wood list).....	30¢
Williams' or Holt's, for metal.....	50¢
Williams' or Holt's, for wood.....	40¢

Ship Augers and Bits—

L. Hommedieu's.....	15¢
Watrous'.....	15¢
Snell's.....	15¢
Snell's Ship Auger Pat'n Car Bits.....	15¢

Awl Hafts—

Sewing, Brass Fer. 7 gr.....	\$3.50
Pat. Sewing, Short.....	\$1.00
Pat. Sewing, Long.....	\$1.20
Pat. Peg, Plain Top.....	\$1.00
Pat. Peg, Leather Top.....	\$1.20

Awls, Brad Sets, &c—

Awls, Sewing, Common.....	7¢
Awls, Sewing, Short.....	40¢
Awls, Pat. Peg.....	40¢
Awls, Shouldered Brad.....	2.70
Awls, Handled Brad.....	\$7.50
Awls, Handled Scratch.....	\$7.50
Awls, Socket Scratch.....	\$1.50

Awl and Tool Sets—

Aiken's Sets, Awls and Tools.....	55¢
Fray's Adj. Tool Hds., No. 1.....	\$12.25
3, \$12; 4, \$9.....	
Miller's Falls Adj. Tool Hds.....	25¢
No. 1, \$12; 2, \$18.....	
Henry's Combination Haft.....	25¢
Brad Sets.....	40¢
No. 42, \$10.50; No. 43, \$12.50.....	70¢
Stanley's Excelsior.....	70¢
No. 1, \$7.50; No. 2, \$4.00; No. 3, \$5.50.....	30¢

Axes—

First quality.....	40¢
Others.....	50¢

Axle Grease—

Fraser's.....	4¢
Fraser's, in boxes.....	7¢
Dixon's Everlasting, in box.....	10¢
Dixon's Everlasting.....	10¢
Lower grades, special brands.....	7¢

Axles—

No. 1.....	4¢
Nos. 7 to 14.....	55¢
Nos. 15 to 18.....	47¢
Nos. 19 to 22.....	70¢
National Tubular Self-Oiling; Standard Farm (1 to 5) and Special Farm (A1 to A5).....	31¢
Over 10 sets.....	33¢

Bag Holders—

Sprengle's Pat.....	18¢
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Balances—

Spring Balances.....	50¢
Common 24-lb.....	50¢
Chatillon's Spring Balances.....	60¢
Chatillon's Circular Spring Balances.....	60¢

Bells—

Hand—	
Light Brass.....	70¢
Extra Heavy.....	80¢
White Metal.....	60¢
Silver Chime.....	34¢
Globe (Cone's Patent).....	25¢
Door—	
Gong, Abbe's.....	33¢
Gong, Yankee.....	45¢
Gong, Barton's.....	40¢
Crank, Taylor's.....	25¢
Crank, Brooks.....	50¢
Crank, Cone's.....	10¢

Crank, Connel's.....	20¢
Lever, Sargent's.....	60¢
Lever, Taylor's Bronzed or Plated.....	net
Lever, Taylor's Japanned.....	25¢
Lever, R. E. M. Co.'s.....	50¢
Pull, Brook's.....	50¢
Pull, Western.....	25¢

Common Wrought.....	60¢
Western.....	20¢
Western, Sargent's list.....	70¢
Kentucky, "Star" list.....	20¢
Dodge, Genuine Kentucky.....	70¢
Texas Star.....	50¢
Call.....	40¢
Farm Bells.....	3¢
Steel Alloy Church and School Bells.....	40¢

Bellows—

Blacksmiths'.....	50¢
Hand Bellows.....	40¢

Belted, Rubber—

Common Standard.....	70¢
Standard.....	70¢
N. Y. B. & P. Co., Carbon.....	60¢
N. Y. B. & P. Co., Diamond.....	50¢

Bench Stops—

Morrill's.....	7¢
Hotchkiss's.....	7¢
Weston's, No. 1, \$10; No. 2, \$9.....	25¢
McGill's.....	7¢

Bits—

Auger, Gimlet, Bit Stock, Drills, &c., see Augers and Bits.	
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Bit Holders—

Extension.....	70¢
Barber's.....	40¢
Ives.....	60¢
Diagonal.....	40¢
Angular.....	40¢

Blind Adjusters—

Domestic.....	7¢
Excelsior.....	10¢
Washburn's Self-Locking.....	20¢

Blind Fasteners—

Macrell's.....	20¢
Van Sand's Screw Pat.....	15¢
Van Sand's Old Pat.....	15¢
Washburn's Old Pattern.....	80¢
Merriman's.....	new list, net
Austin & Eddy No. 2008.....	80¢
Security Gravity.....	80¢

Blind Staples—

Barbed, 1/4 in. and larger.....	7¢
Barbed, 1/8 in.....	8¢

Blocks—

Cleveland Block Co., Mal. Iron.....	50¢
Moore's Novelty, Mal. Iron.....	50¢

Bolts—

Door and Shutter—	
Cast Iron Barrel, Square, &c.....	70¢
Cast Iron Shutter Bolts.....	70¢
Cast Iron Chain (Sargent's list).....	65¢
Ives' Patent Door Bolts.....	50¢
Wrought Barrel.....	70¢
Wrought Square.....	70¢
Wrt Shutter, all Iron, Stanley's.....	60¢
Wrt Shutter, Brass Knob.....	40¢
Wrt Shutter, Sargent's list.....	60¢
Wrt Sunk Flush, Sargent's list.....	55¢
Wrt Sunk Flush, Stanley's list.....	50¢
Wrt B.K. Flush, Com'n.....	55¢

Carriage, Machine, &c—

Com. list June 10, '84.....	75¢
Genuine Eagle, list Oct. '84.....	75¢
Phila. pattern, list Oct. '84.....	75¢
R. B. & W., old list.....	70¢
Machine, according to size.....	75¢
Bolt Ends, according to size.....	75¢
Tire—	
Common, list Feb. 28, '83.....	70¢
Port Chester Bolt and Nut Company.....	70¢
Empire, list Feb. 28, '83.....	82¢
Phila., list Oct. '84.....	82¢
Keystone, Philadel., list Oct. '84.....	80¢
Norway, Phila., list Oct. '84.....	75¢
American Screw Company.....	
Norway, Phila., list Oct. 16, '84.....	75¢
Eagle, Phila., list Oct. 16, '84.....	80¢
Phila., list Oct. 16, '84.....	82¢
Bay State, list Feb. 28, '83.....	70¢
R. B. & W., Philadel., list Oct. 16, '84.....	82¢

Stove and Plow—

Stove.....	65¢
Plow.....	60¢
R. B. & W., Plow.....	55¢

Borax—

Without.....	7¢
With Augers.....	7.50

Boring Machines—

Without.....	7.00
Upright, Angular.....	7.50
Douglas.....	5.50
Snell's, Rice's Pat.....	5.50
Jennings.....	5.50
Other Machines.....	2.35
Phillips' Patent.....	7.00

Bow Pins—

Humason, Beckley & Co.'s.....	50¢
Sargent & Co.'s.....	50¢
Peck, Stow & W. Co.....	50¢

Braces—

Barber's.....	50¢
Nos. 10 to 16.....	50¢
Nos. 30 to 55.....	50¢
Nos. 40 to 65.....	50¢
Barker's.....	75¢
Nos. 8, 10 and 12.....	75¢
Plated, Nos. 8, 10 and 12.....	75¢
Osgood's Ratchet.....	40¢
Spofford's.....	50¢
Ives' New Haven Novelty.....	70¢
New Haven Ratchet.....	60¢
Barber Ratchet.....	60¢
Barber's.....	60¢
Spofford.....	60¢
Common Ball, American.....	\$1.10
Bartholomew's.....	50¢
Nos. 25, 27 and 30.....	50¢
Nos. 117, 118, 119.....	70¢
Anderson's.....	75¢
Barker's Imp'd Plain.....	75¢
Barker's Imp. Nickel.....	75¢
Ratchet.....	75¢
Eclipse Ratchet.....	60¢
Globe Jawed.....	40¢
Corner Brace.....	40¢
Universal, 8 in., \$2.10; 10 in., \$2.25.....	
Buffalo Ball.....	\$1.10
P. S. & W.....	50¢

Brackets—

Shelf plain, Sargent's list.....	55¢
Shelf, fancy, Sargent's list.....	60¢
Reading, plain.....	50¢
Reading, Rosette.....	60¢
Bright Wire Goods.....	55¢

Brollers—

Henis Self-Inch.....	9 10 9x11
Basting.....	Per doz. \$4.50 5.50 6.50

Buckets—See Well Buckets and Pails.

Bull Rings—

Union Co. Nut.....	55¢
Sargent's.....	65

Cards—
Horse & Curry.....10&10&10&10
Cotton.....10&10&10
Wool.....10&10&10

Carpet Stretchers—

Cast Steel, Polished.....\$ doz \$2.25
Cast Iron, Steel Points.....\$ doz 80¢
Socket.....\$ doz \$1.75
Bullard's.....25¢@25¢10¢

Carpet Sweepers—

Bissell No. 5.....\$ doz \$17.00
Bissell No. 7 New Drop Pan.....\$ doz \$19.00
Bissell, Grand.....\$ doz \$36.00
Grand Rapids.....\$ doz \$24.00
Crown Jewel, No. 1, \$18.00; No. 2, \$19.00; No. 3, \$20.00
Magic.....\$ doz \$15.00
Jewel.....\$ doz \$17.00
Improved Parlor Queen, Nickel.....\$ doz \$27.00

Improved Parlor Queen, Japan.....\$ doz \$24.00
Excelior.....\$ doz \$22.00
Garland.....\$ doz \$18.00
Parlor Queen.....\$ doz \$24.00
Housewife's Delight.....\$ doz \$15.00
Queen.....\$ doz \$16.00
Queen, with band.....\$ doz \$20.00
King.....\$ doz \$20.00
Weed, Improved.....\$ doz \$18.00
Hub.....\$ doz \$16.00
Cog-Wheel.....\$ doz \$16.00
Conqueror.....\$ doz \$22.00
Easy.....\$ doz \$22.00
Monarch.....\$ doz \$22.00
Goshen.....\$ doz \$21.00
Advance.....\$ doz \$18.00
Ladies' Friend, No. 1, \$ doz, \$15.00; No. 2, \$ doz, \$16.00
American.....\$ doz \$15.00
Grand Republic.....\$ doz \$35.00

Cartridges—

See Ammunition.

Casters—

Bed.....New list:
Plate.....Brass.....55¢@55¢5¢
Shallow Socket.....Others.....60¢@60¢5¢
Deep Socket.....40¢10¢
Yale Casters, list May, 1884.....30¢10¢40¢
Yale, Gem.....60¢@60¢5¢
Martin's Patent (Phoenix).....45¢10¢50¢
Payson's Anti-friction.....60¢@60¢10¢
Giant Truck Casters.....50¢10¢
Stationary Truck Casters.....50¢10¢
Socket Truck Casters.....50¢

Cattle Leaders—

Humason, Beckley & Co.'s.....70¢
Sargent's.....60¢@10¢
Hotchkiss.....30¢
Peck, Stow & W. Co.....60¢10¢

Chain—

Trace, 6 1/4-10-2, exact, \$ pair, \$1.03.....50¢10¢50¢10¢5¢
Trace, 6 1/4-10-3, exact, \$ pair 92¢.....50¢10¢50¢10¢5¢
Trace, 7-10-2, exact, \$ pair \$1.11.....50¢10¢50¢10¢5¢
NOTE.—Traces "Regular" sizes, 3¢ net \$ pair less than exact.
Log, Fifth, Stretcher, and other fancy Chains, list Nov. 1, 1884.....50¢10¢50¢10¢5¢

American Coil, in cask lots, 3-16 1/4 5-16 3/8 7-16 1/2 5/8 3/4 \$8.75 6.25 5.00 4.50 4.00 3.75 3.50 Less than cask lots, add 1/2¢@3/4¢ lb.
German Coil, list of June 20, 1887.....50¢10¢5¢@60¢

German Halter Chain, list of June 20, 1887.....50¢10¢5¢@60¢

Covert Halter, Hitching and Breast.....50¢2¢

Covert Traces.....35¢@2¢

Onaida Halter Chain.....\$ doz \$5.00@6¢

Galvanized Pump Chain.....\$ doz \$5.00@6¢

Jack Chain, Iron.....75¢@75¢5¢

Jack Chain, Brass.....70¢@70¢5¢

Chalk—

White.....\$ gr 50¢

Red.....\$ gr 70¢

Blue.....\$ gr 85¢

White Crayons, \$ gr 12¢@12¢6¢

Chalk Lines—

See Lines.

Chisels—

Socket Framing and Firmer.

P. S. & W.....75¢@75¢10¢

New Haven.....75¢@75¢5¢

Wetherby.....75¢@75¢5¢

Mix.....75¢@75¢5¢

Douglas.....75¢@75¢5¢

Buck Bros.....75¢@75¢5¢

Merrill.....60¢10¢@60¢10¢5¢

L. & I. J. White.....60¢10¢@60¢10¢5¢

Tanged and Miscellaneous.

Tanged Firmer.....40¢10¢

Butcher's.....\$4.75@5.00

Spear & Jackson's.....\$5 to 2

Buck Bros.....30¢

Cold Chisels, \$ doz.....16¢10¢

Chucks—

Beach Pat.....each, \$8.00.....20¢

Morse's Adjustable, each, \$7.00, 20¢@20¢5¢

Danbury.....each, \$6.00, 30¢@30¢5¢

Syracuse, Balz Pat.....25¢

Clamps—

R. I. Tool Co.'s Wrought Iron.....25¢

Adjustable, Gray's.....20¢

Adjustable, Lambert's.....20¢

Adjustable, Snow's.....40¢5¢

Adjustable, Hammers.....15¢

Adjustable, Stearn's.....20¢10¢

Stearn's Adjustable Cabinet and Corner.....20¢10¢

Cabinet, Sargent's.....60¢@10¢

Carriage Makers', Sargent's.....70¢10¢

Eberhard Mfg. Co.....40¢5¢@40¢10¢

Warner's.....40¢10¢@40¢10¢5¢

Saw Clamps, see Vises

Clips—

Norway, Axle, 1/4 & 5-16.....55¢5¢5¢

2nd grade Norway Axle, 1/4 & 5-16.....65¢5¢

Superior Axle Clips.....60¢5¢@60¢5¢5¢

Norway Spring Bar Clips, 5-16.....60¢5¢5¢
Wrought-Iron Felloe Clips.....40¢5¢
Steel Felloe Clips.....40¢5¢
Baker Axle Clips.....25¢

Cockeyes.....50¢

Cocks, Brass.

Hardware list.....40. & 10¢2¢

Coffee Mills—

Box and Side, list Jan. 1, 1888.....50¢2¢

American, Enterprise Mfg Co. 20¢10¢30¢

The Swift, Lane Bros.....20¢10¢

Compasses Dividers, &c—

Compasses, Callipers, Dividers, 70¢@70¢10¢

Bemis & Call Co.'s.....60¢5¢

Dividers.....60¢5¢

Compasses & Callipers.....50¢5¢

Wing and Inside or Outside.....50¢5¢

Double.....60¢

(Call's Pat. Inside).....50¢

Excelior.....30¢

J. Stevens & Co.'s.....25¢10¢

Starrett's.....25¢10¢

Spring Callipers and Dividers 25¢10¢10¢

Lock Callipers and Dividers.....25¢10¢

Combination Dividers.....25¢10¢

Coopers' Tools—

Bradley's.....20¢

Barton's.....20¢@20¢5¢

L. & I. J. White.....20¢5¢

Albertson Mfg. Co.....25¢

Beatty's.....40¢@40¢5¢

Sandusky Tool Co.....30¢@30¢5¢

Corkscrews—

Humason & Beckley Mfg. Co. 40¢@40¢10¢

Clough's Pat.....33¢@33¢4¢5¢

Howe Bros & Hulbert.....35¢

Cork Knives and Cutters—

Bradley's.....10¢

Wadsworth's.....25¢

Cradles—

Grain.....50¢2¢

Crow Bars—

Cast Steel.....\$ lb 4¢

Iron, Steel Points.....\$ lb 3 1/2¢

Curry Combs—

Fitch's.....50¢10¢@50¢10¢10¢

Rubberper doz \$10.00.....20¢

Perfect.....50¢

Curtain Pins—

Silvered Glass.....net

White Enamel.....net

Cutlery—

Beaver Falls & Booth's.....33¢

Wostenholme.....\$7.75 to 2

Dampers, &c—

Dampers, Buffalo.....50¢

Buffalo Damper Clips.....50¢

Crown Damper.....40¢10¢

Excelior.....40¢10¢

Dividers—

See Compasses.

Dog Collars—

Embossed, Gilt, Pope & Steven's list.....30¢10¢

Leather, Pope & Steven's list.....40¢

Brass, Pope & Steven's list.....40¢

Door Springs—

Torrey's Rod, regular size.....\$ doz \$1.30

Gray's, \$ gr, \$20.00.....20¢

Bee Rod \$ gr, \$20.00.....20¢

Warner's No. 1, \$ doz, \$25.50.....40¢10¢50¢

Gem (Coil), list April 19, 1886.....40¢

Star (Coil), list April 19, 1886.....20¢

Victor (Coil).....60¢@60¢10¢

Champion (Coil).....60¢10¢@60¢10¢10¢

Philadelphia, 5 in., \$5.00; 8 in., \$7.75.....\$

Cowell's.....No. 1, \$ doz, \$18.00; No. 2, \$15.00.....20¢

Rubber complete, \$ doz, \$3.50.....55¢10¢

Hercules.....50¢

Shaw Door Check and Spring, 25¢@30¢35¢

Drawing Knives—

Wetherby.....75¢5¢

P. S. & W.....75¢10¢

Mix.....75¢10¢

New Haven.....60¢10¢@60¢10¢5¢

Merrill.....75¢@75¢5¢

Douglas.....15¢10¢@25¢

L. & I. J. White.....20¢5¢

Bradley's.....25¢10¢@40¢

Watrous.....15¢10¢@25¢

Adjustable Handle.....25¢33¢4¢

Wilkinson's Folding.....25¢25¢5¢

Drills and Drill Stocks—

Blacksmiths'.....each \$1.75

Blacksmiths' Self-Feeding, each \$7.50, 20¢

Breast, P. S. & W.....40¢10¢

Breast, Wilson's.....30¢5¢

Breast, Millers Falls.....each \$3.00, 25¢

Breast, Bartholomew's.....each \$2.50, 25¢10¢@40¢

Ratchet, Merrill's.....20¢20¢5¢

Ratchet, Ingersoll's.....25¢

Ratchet, Parker's.....20¢20¢5¢

Ratchet, Whitney's.....20¢10¢

Ratchet, Weston's.....20¢25¢

Ratchet, Moore's Triple Action.....25¢30¢

Whitney's Hand Drill, Plain, \$11.00.....20¢10¢

Wilson's Drill Stocks.....10¢

Automatic Boring Tools.....\$1.75@1.85

Twist Drills—

Morse.....50¢10¢5¢

Standard.....50¢10¢5¢

Syracuse.....50¢10¢5¢

Cleveland.....50¢10¢5¢

Williams.....50¢10¢5¢

New Process.....dis 50¢10¢5¢

Drill Bits.—See Augers and Bits.

Drill Chucks.—See Chucks.

Dripping Pans—

Small sizes.....\$ doz 6 1/2¢

Large sizes.....\$ doz 6 1/2¢

Egg Beaters.

Dover.....\$ doz \$1.50

National, \$ doz \$4.50.....33¢4¢

Ayres' Spiral.....\$ gro \$17.00@

Duplex (Standard Co.).....\$ gro \$15.00

Rival (Standard Co.).....\$ gro \$12.00

Large Duplex (Standard Co.), \$ doz \$4.50

Triumph (T. & S. Mfg. Co.), \$ gro \$10.50

Advance, No. 1.....\$ gro \$10.50

Advance, No. 2.....\$ gro \$10.00

Bryant's.....\$ gro \$15.00

Double (H. & R. Mfg. Co.).....\$ gro \$16.20

Easy (H. & R. Mfg. Co.).....\$ gro \$14.00

Triple (H. & R. Mfg. Co.).....\$ gro \$16.20

Spiral (H. & R. Mfg. Co.).....\$ gro \$4.50

Paine, Diehl & Co.'s.....\$ gro \$24.00

Egg Poachers—

Buffalo Steam Egg Poachers, \$ doz, No. 1, \$6.00; No. 2, \$9.00.....25¢

Electric Bell Sets—

Wollensak's.....20¢

Bigelow & Dowse.....20¢

Emery—No. 4 to No. 54 to Flour, CF

46 gr. 150 gr. F F F.

Kegs, \$ lb.....4¢ 5¢ 2 1/2¢

1/2 kegs, \$ lb.....4 1/2¢ 5 1/2¢ 2 3/4¢

1/4 kegs, \$ lb.....4 1/4¢ 5 1/4¢ 2 3/8¢

10-lb cans, 10¢ 6 1/2¢ 5¢

In case.....6¢ 6 1/2¢ 5¢

10-lb cans, less than 10.....10¢ 10¢ 7 1/2¢

Enamelled and Tinned Ware—

See Hollow-Ware.

Escutcheon Pins—

Iron, list Nov. 11, 1885.....50¢10¢50¢10¢5¢

Brass.....60¢@60¢5¢

Escutcheons.

Door Lock.....Same dis as Door Locks.

Brass Thread.....60¢@60¢10¢

Wood.....25¢

Faucets.—

Fenn's.....40¢

Bohren's Pat. Rubber Ball.....25¢

Fenn's Cork Stops.....30¢</

Cross-Cut Saw Handles—
Atkins' No. 1 Loop, pair, 80¢; No. 3,
22¢; No. 2 and No. 4 Reversible, 22¢.
Boynton's Loop Saw Handles, 50¢... 60¢
Champion... 15¢

Hangers—
Barn Door, old patterns... 60¢10¢10¢70¢
Barn Door, New England... 60¢10¢10¢70¢
Samson Steel Anti-Friction... 55¢
Orleans Steel... 55¢
Hamilton Wrought Wood Track... 55¢
U. S. Wood Track... 55¢
Champion... 60¢10¢
Rider and Wooster, Medina Mfg. Co.'s
List... 70¢
Climax Anti-Friction... 80¢
Climax Anti-Friction for Wood Track... 35¢
Zenith for Wood Track... 55¢
Reed's Steel Arm... 50¢
Challenge, Barn Door... 50¢
Sterling's Improved (Anti-Friction)... 65¢10¢
Victor, No. 1, \$15.00; No. 2, \$16.50; No.
3, \$18.00... 50¢25¢
Cheriton... 50¢10¢
Kiddie... 50¢10¢60¢
The Boss... 60¢10¢
Best Anti-Friction... 60¢10¢
Duplex (Wood Track)... 60¢10¢25¢
Terry's Pat., 7 dos pr. 4 in, \$10.00; 5 in,
\$12.00... 50¢25¢50¢10¢
Cronk's Pat., No. 4, \$12.00; No. 5, \$14.40;
No. 6, \$18.00... 50¢10¢60¢
Wood Track Iron Clad, 7 ft. 10... 50¢
Carrier Steel Anti-Friction... 50¢10¢55¢
Architect, 7 set \$8.00... 20¢
Eclipse... 20¢10¢
Felix, 7 set \$4.50... 20¢
Richards... 30¢30¢10¢
Lane's Steel Anti-Friction... 40¢10¢
Ball Bearing Door Hanger... 30¢10¢25¢10¢
Warner's Pat... 20¢20¢10¢
Stearns' Anti-Friction... 20¢20¢10¢
Stearns' Challenge... 25¢10¢25¢10¢10¢
Faultless... 40¢40¢55¢
American, 7 set \$8.00... 20¢10¢
Rider & Wooster, No. 1, 62¢; No. 2,
75¢... 40¢10¢
Paragon, Nos. 1, 2 and 8... 40¢10¢
Paragon, Nos. 5, 5½, 7 and 8... 20¢10¢
Crescent... 60¢60¢10¢
Nickel, Cast Iron... 50¢
Nickel, Malleable Iron and Steel... 40¢
Scranton Anti-Friction Single Strap... 35¢45¢
Scranton Anti-Friction Double Strap... 40¢
Universal Anti-Friction... 40¢
Wild West, 4 in. Wheel, \$15.00; 5 in.,
Wheel, \$21.00... 45¢
Star... 40¢10¢40¢10¢55¢
May... 50¢55¢40¢10¢
Barry, \$8.00... 40¢10¢

Harness Snaps—
See Snaps.
Hatchets—
List Jan. 1, 1886... 35¢40¢
Isaiah Blood... 35¢40¢
Hunt's Shingling, Lath and Claw... 40¢55¢
Hunt's Broad... 40¢
Buffalo Hammer Co... 40¢10¢50¢
Hurd's... 40¢10¢50¢
Fayette R. Plumb... 40¢10¢50¢
Wm. Mann, Jr... 50¢50¢55¢
Underhill Edge Tool Co... 40¢50¢10¢
Underhill's, Haines and Bright... 35¢45¢
C. Hammond & Son... 40¢10¢50¢
Simmons... 40¢10¢50¢
Peck's... 40¢10¢40¢10¢55¢
Kelly's... 50¢60¢55¢
Sargent & Co... 50¢
Ten Eyck Edge Tool Co... 40¢10¢40¢10¢55¢
Collins... 10¢

Hay and Straw Knives—
Lightning, Mfrs. price 75¢ \$18.00, 25¢
But jobbers frequently give extras.
Gem... 75¢ \$10
Wadsworth's... 40¢75¢40¢10¢
Carter's Needle... 40¢10¢50¢10¢
Heath's... 40¢10¢50¢10¢
Auburn Hay, Com. and Spear Point... 50¢
Auburn, Straw... 40¢
Noll's Hay... 75¢ \$10.00

Hinges—
Wrought Iron Hinges
Scrap and T... 75¢75¢55¢
Screw Hook and... 14 to 20 in., 7 D... 35¢
Strap... (22 to 36 in., 7 D... 25¢
Heavy Welded... (6 to 12 in., 7 D... 25¢
Hook... (14 to 20 in., 7 D... 35¢
... (22 to 36 in., 7 D... 25¢
Screw Hook... (14 in., 7 dos \$1.50)
and Eye... (14 in., 7 dos \$1.50) 10¢
Rolled Blind Hinges, Nos. 32 and 34... 50¢10¢
Rolled Blind Hinges, Nos. 232 and 234... 55¢10¢
Rolled Plate... 70¢10¢
Rolled Raised... 70¢10¢
Plate Hinges (6, 10 and 12 in., 7 D... 55¢
"Providence" over 12 in., 7 D... 55¢
Spring Hinges—
Geer's Spring and Blank Butts... 40¢
Union Spring Hinge Co.'s List, March,
1886... 20¢
Acme and U. S... 30¢
Empire and Crown... 20¢
Hero and Monarch... 50¢
American, Gem, and Star, Japanned... 20¢
American, Gem, and Star, Bronzed... net
Oxford, Bronze and Brass... net
Barker's Double Acting... 20¢10¢
Union Mfg. Co... 25¢
Bonner's... 30¢
Buckman's... 15¢20¢
Chicago... 30¢
Wilco... 10¢
Devore's... 40¢
Rex... 40¢
Royal... 40¢
Reliable... 40¢
Champion... 40¢

Gate Hinges—
Western... 75¢ \$4.40, 60¢
N. E... 75¢ \$7.00, 55¢
N. E. Reversible... 75¢ \$5.20, 55¢10¢
Clark's, Nos. 1, 2, 3... 60¢10¢55¢
N. Y. State... 75¢ \$5.00, 55¢10¢
Automatic... 75¢ \$12.50, 50¢
Common Sense... 75¢ \$4.50, 50¢
Seymour's... 60¢10¢55¢
Shepard's... 60¢10¢55¢
Reed's Latch and Hinges... 75¢ \$12.00, 50¢

Blind Hinges—
Parker... 75¢42¢
Palmer... 50¢55¢10¢
Seymour... 70¢42¢
Nicholson... 45¢10¢
Huffer... 50¢

Clark's, Nos. 1, 3, 5, 40 and 50... 75¢10¢55¢80¢
Clark's Mortise Gravity... 50¢
Sargent's, Nos. 1, 3, 5, 11, 13... 75¢10¢75¢10¢55¢
Reading's Gravity... 75¢10¢75¢10¢55¢
Shepard's... 75¢10¢55¢
Noiseless... 75¢10¢55¢
Niagara... 80¢25¢
Buffalo... 80¢25¢
Clark's Genuine Pat... 80¢25¢
O. S. Lull & Porter... 75¢10¢
Acme, Lull & Porter... 75¢10¢
Queen City Reversible... 75¢
Clark's Lull & Porter, Nos. 0, 1, 1½,
2, 3, 4, 8... 75¢10¢25¢
North's Automatic Blind Fixtures, No.
2, for Wood, \$10.50; No. 3, for Brick,
\$13.50... 25¢25¢

Hees—
Handled—
Garden, Mortar, &c... 65¢
Planter's, Cotton, &c... 65¢
Green Hoe... 60¢
Maglo... 75¢ \$4.00

Eye—
D. & H. Scovill... 20¢
Lane's Crescent Planter Pattern... 45¢25¢
Lane's Razor Blade Scovill Pattern... 30¢
Maynard, S. & O. Pat... 45¢25¢
Sandusky Tool Co., S. & O. Pat... 60¢
Hubbard & Co., S. & O. Pat... 60¢
Chattanooga Tool Co., S. & O. Pat... 60¢
Grub... 60¢60¢10¢

Hog Rings and Ringers—
Hill's Improved Ringers... 75¢ \$4.50
Hill's Old Style Ringers... 75¢ \$3.00
Hill's Tongue... 75¢ \$4.50
Hill's Rings... 75¢ \$2.25, \$2.40
Perfect Ringers... 75¢ \$1.75, \$2.00
Blair's Hog Ringers... 75¢ \$2.60, \$2.65
Blair's Hog Rings... 75¢ \$2.60, \$2.65
Champion Ringers... 75¢ \$2.00
Champion Rings, Double... 75¢ \$2.25
Brown's Ringers... 75¢ \$2.00
Brown's Rings... 75¢ \$1.25, \$1.30

Hoisting Apparatus—
Moore's Hand Hoist, with Lock
Brake... 20¢
Moore's Differential Pulley Block... 40¢
Energy Mfg. Co.'s... 25¢

Holders, File and Tool—
Bals Pat... 75¢ \$4.00; 25¢
Nicholson File Holders... 20¢

Hollow-Ware—
Iron—
Stove Hollow-Ware—
Ground... 60¢60¢55¢
Unground... 60¢10¢60¢10¢10¢
Enamelled Hollow-Ware—
Maalin Kettles... 65¢10¢
Boilers and Saucepans... 40¢55¢
Tinned Boilers and Saucepans... 40¢
Gray Enamelled-Ware—
Stove... 50¢50¢55¢
Maalin Kettles... 60¢10¢60¢10¢10¢
Boilers and Saucepans... 40¢55¢
Agate and Granite Ware... 25¢
Rustless Hollow-Ware... 50¢50¢55¢
Galvanized Kettles—
Inch... 6 7 8 9
Each... 55¢ 60¢ 65¢ 75¢

Silver Plated—
4 mo. or 5 ½ cash in 30 days.
Reed & Barton... 40¢25¢
Meriden Britannia Co... 40¢25¢
Simpson, Hall, Miller & Co... 40¢25¢
Rogers & Brother... 40¢25¢
Hartford Silver Plate Co... 40¢25¢
William Rogers Mfg. Co... 40¢25¢

Hooks—
Cast Iron—
Bird Cage, Sargent's List... 60¢10¢10¢
Bird Cage, Reading... 60¢10¢10¢
Clothes Line, Sargent's List... 60¢10¢10¢
Clothes Line, Reading... 60¢10¢10¢
Ceiling, Sargent's List... 55¢10¢10¢
Harnes, Reading List... 55¢10¢55¢10¢10¢
Coat and Hat, Sargent's List... 55¢10¢60¢10¢
Coat and Hat, Reading... 50¢10¢50¢10¢10¢

Wrought Iron—
Cotton... 75¢ \$1.25
Cotton Pat. (N. Y. Mallet & Handle Works)... 90¢
Tassel and Picture (T. & S. Mfg. Co.)... 50¢
Wrought Staples, Hooks, &c... 60¢10¢
See Wrought Goods.

Wire—
Wire Coat and Hat, Gem, List April,
1886... 45¢
Wire Coat and Hat, Miles, List April,
1886... 45¢
Indestructible Coat and Hat... 45¢
Wire Coat and Hat, Standard... 45¢
Belt... 75¢10¢80¢

Miscellaneous—
Grass, No. 2, \$2.00; No. 3, \$2.25; No. 4, \$2.50
Noll's Grass... 75¢ \$2.25
Whitmore Patent... 55¢60¢
Hooks and Eyes—Malleable Iron... 70¢70¢10¢
Hooks and Eyes—Brass... 60¢10¢10¢
Fish Hooks, American... 50¢
Bench Hooks... See Bench Stops.

Horse Nails—
Nos. 6 7 8 9 10
Ausable... 25¢ 26¢ 25¢ 24¢ 23¢
Clinton, Fin... 25¢ 22¢ 21¢ 20¢ 19¢
Essex... 25¢ 26¢ 25¢ 24¢ 23¢
Lyra... 25¢ 23¢ 22¢ 21¢ 20¢
Snowden... 25¢ 23¢ 22¢ 21¢ 20¢
Putnam... 23¢ 21¢ 20¢ 19¢ 18¢
Vulcan... 23¢ 21¢ 20¢ 19¢ 18¢
Northwest'n... 25¢ 23¢ 22¢ 21¢ 20¢

**Globe... 23¢ 21¢ 20¢ 19¢ 18¢, 20¢25¢
Boston... 23¢ 21¢ 20¢ 19¢ 18¢, 20¢25¢
A. C... 25¢ 23¢ 22¢ 21¢ 20¢
C. B. K... 25¢ 23¢ 22¢ 21¢ 20¢
Champlain... 25¢ 26¢ 25¢ 24¢ 23¢**

Lines—
Cotton and Linen Fish, Draper's... 50¢
Draper's Chalk... 60¢
Draper's Mason's Linen, 84 ft., No. 1,
\$1.25; No. 2, \$1.75; No. 3, \$2.25; No. 4,
\$2.75; No. 5, \$3.25... 25¢
Cotton Chalk... 55¢
Samson, Cotton, No. 4, \$2; No. 4½, \$2.50;
No. 5, \$3.00... 10¢
Silver Lake, Braided, No. 0, \$6.00; No. 1,
\$6.50; No. 2, \$7.00; No. 3, \$7.50... 25¢
Mason's Linen, No. 3½, \$1.50; No. 4,
\$2.00; No. 4½, \$2.50... 25¢
Mason's Colored Cotton... 45¢
Wire Clothes... Nos. 18 19 20
\$3.00 \$3.00 \$2.50

New Haven... 25¢ 26¢ 25¢ 24¢ 23¢
Saranac... 23¢ 21¢ 20¢ 19¢ 18¢
Champion... 25¢ 23¢ 22¢ 21¢ 20¢
Capewell... 23¢ 26¢ 25¢ 24¢ 23¢
Star... 23¢ 21¢ 20¢ 19¢ 18¢
Anchor... 23¢ 21¢ 20¢ 19¢ 18¢
Western... 23¢ 21¢ 20¢ 19¢ 18¢
Empire Bronzed... 14 15 16
Horse Shoes—See Shoes Horse.

Hose, Rubber—
Competition... 75¢10¢75¢10¢55¢
Standard... 70¢70¢10¢
Extra... 60¢60¢10¢
N. Y. B. & P. Co., Para... 80¢10¢
N. Y. B. & P. Co., Extra... 50¢
N. Y. B. & P. Co., Dundee... 60¢10¢55¢

Haskers—
Blair's Adjustable... 75¢ \$8.00
Blair's Adjustable Clipper... 75¢ \$7.00

Indurated Fiber-Ware.
Spittoons, No. 2, 7 dos... 75¢
Basins, Ringed, 7 dos, No. 1, \$3.70;
No. 2, \$3.10; No. 3... \$2.70
Washtubs, Nested, Nos. 0, 1, 2 and 3 (4
pieces), 7 dos, nests... \$15.87
Keelers, Nested, Nos. 1, 2, 3 and 4 (4
pieces), 7 dos, nests... \$5.37
Butter Bowls, 15, 17 and 19-inch (3
pieces), 7 dos, nests... \$6.75
Liquid Measures, pt., qt., 2 qt. and fun-
nel (4 pieces), 7 set... \$3.00
Dry Measures, 1, 2, 4, 8 and 16 qts. (5
pieces), 7 set... \$2.25
See also Fills.

Jack Screws—See Screws.

Kettles—
Spun. Stamped.
Brass, 7 to 17 in., 7 D... 24¢ 21¢
Brass larger than 17 in.,
7 D... 25¢ 23¢4¢
Enamelled and Tea Kettles...
See Hollow-Ware.

Keys—
Lock Ass'n's List Dec. 30, 1886... 50¢10¢
Eagle, Cabinet, &c... 35¢45¢25¢
Hotchkiss' Brass Blanks... 40¢
Hotchkiss' Copper and Tinned... 40¢
Hotchkiss' Pad, and Cab... 35¢
Hatchet Bed Keys... 75¢ \$4.00, 15¢
Wollensack Tinned... 50¢10¢

Knife Sharpeners—
Parkin's...
Applowood Handles... 75¢ \$6.00, 40¢
Rosewood or Cocobolo... 75¢ \$6.00, 40¢

Knives—
Wilson's Butcher Knives... 25¢90¢
Ames' Butcher Knives... 25¢
Foster Bros' Butcher, &c... 40¢
Nichols' Butcher Knives... 40¢10¢
Ames' Shoe Knives... 75¢ \$1.50, 15¢20¢
Ames' Bread Knives... 20¢
Moran's Shoe and Bread... 20¢
Hay and Straw... See Hay Knives.
Table and Pocket... See Cutlery.
Corn, Auburn Mfg. Co. Western Pat... \$2.00
Corn, Auburn Mfg. Co. Crescent... \$3.50

Knobs—
Door Mineral... 65¢68¢
Door Por. Jap'd... 75¢78¢
Door Por. Nickel... \$2.00\$2.25
Door Por. Plated, Nickel... \$2.00\$2.25
Drawer, Porcelain... 60¢10¢60¢10¢10¢
Hemlock Door Knobs... 40¢10¢50¢
Yale & Towne Wood, List Dec. 1885... 40¢
Furniture Plain... 75¢ gro inch 10¢
Furniture, Wood Screws... 25¢10¢
Base, Rubber Tip... 70¢10¢55¢
Picture, Judd's... 60¢10¢10¢70¢
Picture, Sargent's... 70¢10¢
Picture, Hemlock... 35¢55¢
Shutter, Porcelain... 65¢10¢
Carriage, Jap... 75¢ gro 80¢, 60¢10¢

Ladies—
Melting, Sargent's... 55¢10¢
Melting, Reading... 35¢10¢
Melting, Monroe's Pat... 75¢ \$4.00, 40¢
Melting, P. S. & W... 35¢10¢40¢
Melting, Warner's... 30¢

Lawn Mowers—
Standard List... 50¢10¢
Quaker City... 60¢10¢
Enterprise... 60¢10¢

Lanterns—
Tubular—
Plain with Guards, 7 dos... \$4.00\$4.25
Lift Wire, with Guards... \$4.50\$4.75
Square Plain, with Guards... \$4.00\$4.25
S. Lift Wire, with Guards... \$4.25\$4.50
Without Guards, 25¢ 7 dos less.

Miscellaneous—
Police, Small, \$6.00; Medium, \$7.25;
Large, \$9.75... 20¢25¢

Lemon Squeezers—
Porcelain Squeezed, No. 1... 75¢ \$3.00,
25¢30¢
Wood, No. 2... 75¢ \$3.00, 35¢
Wood, Common... 75¢ \$1.70\$1.75
Dunlap's Improved... 75¢ \$3.75, 20¢
Sammls... No. 1, \$5.00; No. 2, \$3.12;
\$18 7 dos... 25¢10¢
Jennings' Star... 75¢ \$2.50
The Boss... 75¢ \$2.50
Dean's, Nos. 1, 7 dos \$6.50; 2, \$3.35; 3,
\$1.90... 10¢

**Little Giant... 50¢50¢55¢
King... 40¢55¢**

Lines—
Cotton and Linen Fish, Draper's... 50¢
Draper's Chalk... 60¢
Draper's Mason's Linen, 84 ft., No. 1,
\$1.25; No. 2, \$1.75; No. 3, \$2.25; No. 4,
\$2.75; No. 5, \$3.25... 25¢
Cotton Chalk... 55¢
Samson, Cotton, No. 4, \$2; No. 4½, \$2.50;
No. 5, \$3.00... 10¢
Silver Lake, Braided, No. 0, \$6.00; No. 1,
\$6.50; No. 2, \$7.00; No. 3, \$7.50... 25¢
Mason's Linen, No. 3½, \$1.50; No. 4,
\$2.00; No. 4½, \$2.50... 25¢
Mason's Colored Cotton... 45¢
Wire Clothes... Nos. 18 19 20
\$3.00 \$3.00 \$2.50

Ventilator Cord, Samson Braided,
White or Drab Cotton... 75¢ \$7.50, 20¢

Locks, &c.—
Door Locks, Latches, &c.
List Dec. 30, '86, chgd Feb. 2, '87... 50¢10¢60¢55¢
Mallory, Wheeler & Co., List July, '88... 50¢10¢60¢
Sargent & Co., List Aug. 1, '88... 10¢60¢10¢
Reading Hardware Co., List Feb. 2, '88... 55¢60¢10¢
Livingston & Co... 70¢
Note.—Lower net prices often made.
Perkins' Burglar Proof... 60¢25¢
Plate... 35¢45¢
F. Many's "Extension Cylinder" \$10.50
7 dos
Barnes Mfg. Co... 40¢40¢10¢
Yale... net prices
Deitz Flat Key... 20¢
L. & C. Round Key Latches... 30¢10¢
L. & C. Flat Key Latches... 35¢45¢
Romer's Night Latches... 15¢
Shepardson or U. S... 35¢
Feller or American... 40¢10¢
Seed's N. Y. Hesp Lock... 25¢

Cabinet—
Eagle, Gaylord Par... List March, '84, rev.
ker and Corbin... Jan. 1, '85, 35¢45¢
Deitz, Nos. 36 to 39... 40¢
Deitz, Nos. 51 to 63... 40¢10¢
Deitz, Nos. 86 to 96... 30¢
Stoddard Lock Co... 30¢35¢45¢
"Champion" Night Latches... 40¢
Barnes Mfg. Co... 40¢40¢10¢
Eagle and Corbin Trunk... 25¢25¢
"Champion" Cab. and Corbin... 35¢45¢
Yale... net prices
Romer's... 25¢

Padlocks—
List Dec. 23, '84... 75¢75¢10¢
Yale Lock Mfg. Co.'s... net prices
Eagle... 35¢45¢
Eureka, Eagle Lock Co... 40¢25¢
Romer's, Nos. 0 to 91... 30¢
Romer's Scandinavian, &c., Nos. 100 to
506... 15¢
A. E. Deitz... 40¢
Champion Padlocks... 40¢
Hotchkiss... 30¢
Star... 45¢
Horsehoe... 75¢ \$9.40, 40¢10¢
Barnes Mfg. Co... 40¢40¢10¢
Nock's... 30¢
Brown's Pat... 25¢
Scandinavian... 90¢60¢10¢
Fram's Pat. Scandinavian low list... 60¢
Ames Sword Co. up to No. 150... 40¢
Ames Sword Co. above No. 150... 50¢

Lumber Tools.
Ring Peavies, "Blue Line"... 75¢ \$20.00
Steel Peavies, Common... 75¢ \$18.00
Steel Socket Peavies... 75¢ \$20.00
Mall. Iron Socket Peavies... 75¢ \$19.00
Cant Hooks, "Blue Line"... 75¢ \$16.00
Cant Hooks, Common Finish... 75¢ \$14.00
Cant Hooks, Mall. Socket Clasp, "Blue
Line" Finish... \$16.00
Cant Hooks, Mall. Socket Clasp, Com-
mon Finish... 75¢ \$14.50
Cant Hooks, Clip Clasp, "Blue Line"
Finish... 75¢ \$14.00
Cant Hooks, Clip Clasp, Common Fin-
ish... 75¢ \$12.00
Hand Spikes... 75¢ 6 ft., \$15.00; 8 ft.,
\$20.00
Pike Poles, Pike & Hook, 7 dos, 12 ft.,
\$11.50; 14 ft., \$12.50; 16 ft., \$14.50;
18 ft., \$17.50; 20 ft., \$21.50.
Pike Poles, Pike only, 7 dos, 12 ft.,
\$10.00; 14 ft., \$11.00; 16 ft., \$13.00; 18
ft., \$16.00; 20 ft., \$20.00.
Pike Poles, not ironed, 7 dos, 12 ft.,
\$8.00; 14 ft., \$7.00; 16 ft., \$9.00; 18
ft., \$12.00; 20 ft., \$16.00.
Setting Poles, 7 dos, 12 ft., \$14.00; 14
ft., \$15.00; 16 ft., \$17.00
Swamp Hooks... 75¢ \$18.00

Lustre—
Four-ounce Bottles... 75¢ \$1.75; 7
gross... \$17.00

Mallets—
Hickory... 30¢10¢20¢10¢10¢
Lignumvitae... 30¢10¢20¢10¢10¢
B. & L. Block Co., Hickory & L. V... 30¢30¢10¢

Match Safes—
Dangerfield's Self-Igniting... 75¢ \$1.50.
Mattecks, Regular list... 60¢55¢60¢10¢

Meat Cutters—
Dixon's 7 dos... 40¢25¢
Nos... 1 2 3 4
\$14.00 \$17.00 \$19.00 \$30.00
Woodruff's 7 dos... 40¢45¢
Nos... 100 150
\$15.00 \$18.00
Champion 7 dos... 40¢45¢
Nos... 200 300 400
\$22.00 \$27.00 \$40.00
Hales Pattern 7 dos... 70¢70¢55¢
Nos... 11 12 13
\$27.00 \$38.00 \$45.00
American... 30¢
Nos... 1 2 3 4 B 5
Each... \$5 \$7 \$10 \$25 \$50 \$90
Enterprise... 30¢
Nos... 10 12 22 32 42
Each... \$3 \$2.50 \$4 \$6 \$15
Pennsylvania... 40¢10¢
Nos... 1 2 3 00
7 dos... \$24.00 \$28.00 \$36.00 \$38.00
Miles' Challenge 7 dos... 45¢45¢10¢
Nos... 1 2 3
\$22.00 \$30.00 \$40.00
Home No. 1... 75¢ \$36.00, 55¢10¢
Draw Cut, each:
Nos... 2 3 4 8
\$50 \$75 \$80 \$225... 20¢25¢
Beef Shavers (Enterprise)... 20¢10¢30¢
Chadborn's Smoked Beef Cutter... 75¢
\$68.00

Mining Knives—
Am. (2d quality), 7 gr., 1 blade, 7¢; 2
blades, \$12; 3 blades, \$18... net
Lothrop's... 30¢10¢
Smith's, 7 dos, Single, \$2.00; Double, \$3.
40¢45¢
Knapp & Cowles... 50¢10¢60¢
Buffalo Adjustable... 75¢ \$3.00, 25¢

Melasses Gates—		Plane Irons—		Razors—		Atkins' Silver Steel Diamond X Cuts	
Stebbin's Pat.	70¢@70¢71¢	Plane Irons, Butcher's, \$5.00@5.25 to 2	20¢10¢	J. R. Torrey Razor Co.	20¢	Atkins' Special Steel Dexter X Cuts	foot 70¢
Stebbin's Genuine.	60¢10¢10¢	Plane Irons, Buck Bros.	30¢	Wootenholme and Butcher, \$10.00 to 2	10¢	Atkins' Special Steel Diamond X Cuts	foot 50¢
Chase's Hard Metal.	50¢10¢	Plane Irons, Auburn Tool Co., "This- le"	40¢			Atkins' Champion and Electric Tooth X Cuts.	foot 27¢@38¢
Bush's	70¢@70¢10	Sandusky Tool Co.: Single and Cut.	30¢			Atkins' Hollow Back X Cuts.	foot 18¢
Lincoln's Pattern.	70¢@70¢10	Double	40¢			Atkins' Mulay, Mill and Drag.	40¢
Wood's	20¢10¢	L. & I. J. White.	25¢			W. M. & C. Champion X Cuts, Regu- lar.	foot 24¢@25¢
Boss, # dos:		Pliers and Nippers—				W. M. & C. X Cuts, Thin Back.	foot 27¢@29¢
No. 1, 7; No. 2, 8; No. 3, 9; No. 4, 10.	60¢10¢10¢	Button's Patent.	30¢10¢40¢			Peace Circular and Mill.	45¢10¢
Money Drawers.	dos, \$18@30	Hall's No. 2, 5 in., \$18.50; No. 4, 7 in. \$21.00 # dos.	20¢10¢35¢			Peace Hand Panel and Rip.	20¢10¢10¢
Muzzles—		Humason & Beckley Mfg. Co. 50¢60¢10¢				Peace Cross Cuts, Standard.	foot 25¢
Safety.	dos, \$3.00, 25¢	Gas Pliers.	60¢			Peace Cross Cuts, Thin Back.	foot 27¢@28¢
Nails, see Trade Report.		Gas Pliers, Custer's Nickel Plated. 60¢5¢				Richardson's Circular and Mill.	45¢45¢10¢
Wire Nails & Brads, list July 14, '87	70¢10¢	Eureka Pliers and Nippers.	40¢			Richardson's X Cuts, No. 1, 38¢; No. 2, 27¢; No. 3, 24¢	
Wire Nails, Standard Penny.	\$2.50@2.60	Russell's Parallel.	25¢				
Nail Puller—		P. S. & W. Cast Steel.	50¢				
Curtis Hammer.	dos \$9.00	P. S. & W. Tinniers' Cutting Nippers.	add 5¢ dia 10¢				
Giant, No. 1.	dos \$20.00, 10¢	Carew's Pat. Wire Cutters.	20¢				
Pelican.	dos \$2.00, 25¢	Morrill's Parallel. # dos, \$12.00.	30¢5¢				
Boss.	dos \$80.00, 30¢	Cronk's 8 in., \$15.00; 10 in. \$21.00.	40¢40¢5¢				
Lightning.	dos \$21.00						
Nail Sets—		Plumbs and Levels—					
Square.	gr, \$4.00@4.25	Regular List.	70¢10¢70¢10¢10¢				
Round.	gr, \$3.25	Diastion's.	45¢10¢				
Cannon's Diamond Point.	gr, \$12.30	Pocket Levels.	70¢10¢70¢10¢10¢				
Nut Crackers—		Davis Iron Levels.	30¢				
Table (H. & B. Mfg. Co.)	40¢	Davis' Inclination.	10¢10¢				
Blake's Pattern.	dos \$2.00, 10¢	Polish, Metal.					
Turner & Seymour Mfg. Co.	50¢	Prestoline.	20¢10¢				
Nuts—		Krestoline Paste.	33¢4¢				
Nuts, off list Jan. 1, 1888: Square, Hex.	5.4¢ 5.9¢	Gaston's Silver Compound.	33¢4¢				
Hot Fressed.	5.4¢ 5.9¢	Pokes, Animal—					
Cold Punched.	5.4¢ 5.9¢	Bishop's I. X. L.	dos \$6.50				
In lots less than 100 lb, # b, add 1/4¢; 1-b boxes, add 1¢ to list.		Bishop's O. K.	dos \$5.50				
Oakum—		Bishop's Pioneer.	dos \$3.75				
Government.	# b 7¢ @ 8¢	Bishop's American.	dos \$3.00				
U. S. Navy.	# b 6¢ @ 7¢	Peppers, Corn—					
Navy.	# b 5¢ @ 6¢	Round or Square, 1 qt. # gr \$12.00@15.00					
Oilers—		Round or Square, 2 qt. # gr \$25.00@28.00					
Zinc and Tin.	65¢@65¢10¢	Post Hole and Tree Augers					
Brass and Copper.	50¢10¢50¢10¢5¢	Samson Post Hole Digger, # dos \$36.00.					
Malleable, Hammers' Improved, No. 1, \$3.60; No. 2, \$4.00; No. 3, \$4.40 # dos.	10¢10¢10¢	Fletcher Post Hole Augers, # dos \$36.00.					
Malleable, Hammers, Old Pattern, same list.	40¢	Eureka Diggers.	dos \$16.00@17.00				
Prior's Pat. or "Paragon" Zinc.	60¢10¢10¢	Leed's.	dos \$8.00@9.00				
Olmstead's Tin and Zinc.	50¢	Vaughan's Post Hole Auger, # dos \$13.00@14.00					
Olmstead's Brass and Copper.	50¢	Kohler's Little Giant.	dos \$18.00				
Broughton's Zinc.	60¢	Kohler's Hercules.	dos \$15.00				
Broughton's Brass.	50¢	Kohler's New Champion.	dos \$20.00				
Packing, Steam—		Schneider.	dos \$18.00				
Rubber.		Ryan's Post Hole Diggers.	dos \$24.00				
Standard.	60¢10¢60¢10¢10¢	Cronk's Post Bars, # dos \$80.00.					
Extra.	60¢10¢60¢	Gibb's Post Hole Digger, # dos \$30.00.					
N. Y. B. & P. Co., Standard.	50¢10¢5¢						
N. Y. B. & P. Co., Empire.	70¢	Potato Parers—					
N. Y. B. & P. Co., Salamander.	# b 5¢, 30¢	White Mountain.	dos \$5.00@5.50				
Jenkins' Standard.	# b 80¢, 35¢	Antrim Combination.	dos \$8.00				
Miscellaneous—		Hoosier.	dos \$13.50				
American Packing.	10¢@11¢ # b	Pruning Hooks and Shears—					
Russia Packing.	14¢ # b	Diastion's Combined Pruning Hook and Saw.	dos \$18.00, 20¢10¢				
Italian Packing.	13¢@14¢ # b	Diastion's Pruning Hook, # dos \$12.00.					
Cotton Packing.	15¢@17¢ # b	E. S. Lee & Co.'s Pruning Tools.	40¢				
Jute.	7¢@8¢ # b	Pruning Shears, Henry's Pat, # dos \$3.75@4.00 net					
Padlocks—		Henry's Pruning Shears, # dos \$4.25.					
See Locks.		Wheeler, M. & C. Co.'s Combination, # dos \$12.00, 20¢					
Pails—		Dunlap's Saw and Chisel, # dos \$8.50, 80¢					
Galvanized Iron—		J. Mallinson & Co., No. 1, \$5.25; No. 2, 7.25					
Quarts.	10 12 14	Pallets—					
Hill's Light Weight, # dos \$3.75, 3.00, 3.25		Hot House, Awning, &c.	60¢10¢				
Hill's Heavy Weight, # dos 3.00, 3.25, 3.75		Japanned Screw.	60¢10¢				
Whiting's.	2.75 3.00 3.25	Brass Screw.	60¢10¢				
Sidney Shephard & Co.	2.80 3.00 3.40	Japanned Side.	60¢10¢				
Iron Clad.	2.75 3.00 3.25	Japanned Clothes Line.	60¢10¢				
Fire Buckets.	2.75 3.25 3.50	Empire Sash Pulley.	50¢60¢				
Buckets, see Well Buckets.		Empire's Sash, Anti-Friction.	60¢				
Incandescent Fibre Ware—		Hay Fork, Solid Eye, 50¢10¢50¢10¢5¢					
Star Pails, 12 qt.	dos \$4.50	Hay Fork, "Anti-Friction," 5 in. Solid, \$5.70					
Fire, Stable and Milk, 14 qt.	dos \$5.85	Hay Fork, "F" Common and Pat. Bush.	20¢				
Pencils—		Hay Fork, Tarbox Pat. Iron.	20¢				
Faber's Carpenters'.	high list 50¢	Hay Fork, Reed's Self-Lubricating.	60¢				
Faber's Round Gilt.	gr \$2.25	Shade Rack.	45¢				
Dixon's Lead.	gr \$4.50	Block Blocks.	See Blocks				
Dixon's Lumber.	gr \$6.75	Moore's Anti-Friction 5 in. Wheel, # dos \$12.00.	40¢				
Dixon's Carpenters'.	40¢10¢	Pumps—					
Picks—		Cistern, Best Makers.	50¢10¢60¢				
Railroad or Adze Eye, 5 to 6, \$12.00; 6 to 7, \$13.00.	60¢5¢60¢10¢	Pitcher Spout, Best Makers.	60¢10¢60¢				
Picture Nails—		Pitcher Spout, Cheaper Goods.	70¢10¢5¢				
Brass Head, Sargent's list.	50¢10¢10¢	Punches—					
Brass Head, Combination list.	50¢10¢	Saddlers' or Drive, good, # dos.	80¢65¢				
Porcelain Head, Sargent's list.	50¢10¢10¢	Bemis & Call Co.'s Cast Steel Drive.	50¢5¢				
Porcelain Head, Combination list.	40¢10¢	Bemis & Call Co.'s Springfield Socket.	50¢5¢				
Niles' Patent.	40¢	Spring, good quality.	dos \$2.50@2.60				
Pinking Irons—		Spring, Leach's Pat.	15¢				
dos 65¢ net		Bemis & Call Co.'s Spring and Check.	40¢				
Pipe, Wrought Iron—		Solid Tinniers'.	dos \$1.44, 55¢				
1 1/4 and under, Plain.	50¢	Tinniers' Hollow Punches.	20¢2¢				
1 1/4 and under, Galvanized.	57¢4¢	Rice Hand Punches.	15¢				
1 1/4 and over, Plain.	67¢4¢	Avery's Revolving.	30¢10¢				
1 1/4 and over, Galvanized.	55¢	Avery's Saw-Set and Punch. See Saw Sets.					
Boiler Tubes, Iron.		Rail—					
1 1/4 and under.	57¢4¢	Sliding Door, Wrt Brass, # b 35¢.	15¢				
2 in. to 2 1/2 in.	62¢4¢	Sliding Door, Bronzed Wrt Iron, # ft 7¢					
3 in. and larger.	65¢	Sliding Door, Iron, Painted, # foot 4¢, 40¢					
Planes and Plane Irons—		Barn Door, Light. in.	3¢				
Wood Planes—		Per 100 feet.	\$2.00 2.50 3.10, 10¢				
Molding.	50¢5¢50¢10¢	B. D. for N. E. Hangers.					
Beach, First Quality.	60¢60¢5¢						
Beach, Second Quality.	60¢10¢60¢10¢						
Bailey's (Stanley R. & L. Co.)	40¢10¢						
Iron Planes—							
Bailey's (Stanley R. & L. Co.)	40¢10¢						
Miscellaneous Planes (Stanley R. & L. Co.)	30¢10¢						
Victor Planes (Stanley R. & L. Co.)	30¢10¢						
Steer's Iron Planes.	35¢@35¢5¢						
Meriden Mal. Iron Co.'s.	30¢10¢30¢10¢10¢						
Birmingham Plane Co.	50¢50¢5¢						
Gage Tool Co.'s Self-Setting.	20¢10¢						
Chaplin's Iron Planes.	40¢40¢5¢						
Sargent's.	30¢10¢30¢10¢10¢						

Machine— Flat Head, Iron.....55¢ Round Head, Iron.....50¢	Soldering Irons— Covert's Adjustable, list Jan. 1, 1888.....35¢	Common and Patent Brads, 70&100 10&100 Hungarian Nails.....70&100 Chair Nails.....70&100 Zinc Glaziers' Points.....50&100 Cigar Box Nails.....50&100 Picture-Frame Points.....50&100 Looking-Glass Tacks.....50&100 Leathered Carpet.....50&100 Brush Tacks.....50&100 Shoe Finders, List Jan. 2, 1888, 10&100	Parker's.....30¢ Wilson's.....55¢ Howard's.....40¢ Bonney's.....40¢ Miller Falls.....40¢ Trenton.....40¢ Merrill's.....15¢ Sargent's.....60¢ Backus and Union.....40¢ Double Screw Leg.....15¢ Prentiss.....20¢ Simpson's Adjustable.....40¢ Moore's.....20¢
Bench and Hand— Bench, Iron.....55¢ Bench, Wood, Beech.....50¢ Bench, Wood, Hickory.....50¢ Hand, Wood.....50¢ Lag, Blunt Point.....75¢ Coach and Lag, Gimlet Point.....75¢ Bed.....25¢ Hand Rail, Sargent's.....60¢ Hand Rail, H. & B. Mfg. Co.....70¢ Hand Rail, Am. Screw Co.....70¢ Jack Screws, Miller Falls list.....50¢ Jack Screws, P. S. & W.....85¢ Jack Screws, Sargent.....60¢ Jack Screws, Stearns.....40¢	Speke Trimmers— Bonney's.....\$ doz \$10.00, 50¢ Stearns.....20¢ Ives, No. 1, \$15.00; No. 2, \$12.00 Douglas.....\$ doz \$0.00, 20¢	Line and Saddle Nails, List Jan. 1, 1888: Silvered.....30¢ Janned.....30¢ Double-Pointed Tacks.....85¢ Wire Carpet Nails.....50¢ Wire Brads & Nails, see Nails Wire Steel Wire Brads, R. & E. Mfg. Co.'s list.....50¢	Saw Filers— Bonney's, Nos. 2 & 3, \$15.00.....40¢ Stearns.....33¢ Stearns's Silent Saw Vices.....35¢ Sargent's.....60¢ Hopkins.....\$ doz \$17.50, 10¢ Reading.....40¢ Wentworth.....\$ gr \$42.00 Combination Hand Vices.....20¢ Cowell Hand Vices.....20¢ Bauer's Pipe Vices.....10¢
Scroll Saws— Lester, complete, \$10.00.....25¢ Rogers, complete, \$4.00.....25¢ Barnes' Builders' and Cabinet Makers.....25¢ Barnes' Scroll Saw Blades.....35¢	Speens and Forks— Tinned Iron— Basting, Cen. Stamp, Co.'s list.....70¢ Solid Table and Tea, Cen. Stamp, Co.'s list.....70¢ Buffalo S. S. Co.....35¢ Silver Plated—(4 mos. or 5¢ cash 30 days) Meriden Brit. Co., Rogers.....50¢ C. Rogers & Bros.....50¢ Rogers & Bro.....50¢ Reed & Barton.....50¢ Wm. Rogers Mfg. Co.....50¢ Simpson, Hall, Miller & Co.....50¢ Holmes & Edwards Silver Co.....50¢ Silver Plated.....50¢ No. 67 Mexican Silver.....50¢ No. 30 Silver Metal.....50¢ No. 24 German Silver.....50¢ No. 49 Nickel Silver.....50¢ German Silver.....50¢ German Silver, Hall & Elton, 50&55¢ cash Nickel Silver.....50¢ Britannia.....60¢ Boardman's Flat Ware.....50¢ Boardman's Nickel Silver.....50¢ Boardman's Britannia Spoons, cut & lots.....60¢	Tap Borers— Common and Rind.....20¢ Ive's Tap Borers.....35¢ Enterprise Mfg. Co.....30¢ Clark's.....35¢	Wagon Boxes— Per b.....24¢
Scythe Snaths.....50¢ Shears— American (Cast) Iron.....75¢ Pruning.....See Pruning Hooks and Shears Barnard's Lamp Trimmers.....\$ doz \$3.75 Tinnars.....20¢ Seymour's, List.....80¢ Heinrich's, List, Dec. 1881.....60¢ Heinrich's Tailor's Shears.....60¢ First quality C. S. Trimmers.....80¢ Second quality C. S. Trimmers.....80¢ Acme Cast Shears.....10¢ Diamond Cast Shears.....10¢ Clippers.....10¢ Victor Cast Shears.....75¢ Howe Bros. & Hulbert, Solid Forged Steel.....40¢ Chicago Drop Forge & F. Co., Solid Steel Forged.....70¢ Clausen Shear Co., Japaned.....70¢ Clausen Shear Co., Nickel, same list.....60¢	Springs— Elliptic, Concord, Platform and Half Scroll.....60¢ Cliff's Bolster Springs.....25¢	Tapes, Measuring— American.....25¢ Spring.....40¢ Chesterman's, Regular list.....25¢	Wagon Jacks— Daisy.....\$ doz \$4.00, 25¢
Sheaves— Sliding Door— M. W. Co., list July, 1888.....50¢ E. & E. list Dec. 18, 1885.....55¢ Corbin's list.....60¢ Patent Roller.....60¢ Patent Roller, Hatfield's.....75¢ Russell's Anti-Friction, list Dec. 18, 1885.....60¢ Moore's Anti-Friction.....50¢ Sliding Shutter— R. & E. list Dec. 18, 1885.....60¢ Sargent's list.....60¢ Reading list.....60¢	Staples— Fence Staples, Galvanized.....Same price Fence Staples, Plain.....as Br'd Wire See Trd. Rep.	Thermometers— Tin Case.....30¢ Tin Case.....30¢	Washer Cutters— Smith's Pat.....\$ doz \$12.00, 20¢ Johnson's.....\$ doz \$11.00, 33¢ Penny's, \$ doz Pol. \$14; Jap'd, \$16.00, 55¢ Appleton's.....\$ doz \$16.00, 60¢ Bonney's.....40¢
Ship Tools— L. & I. J. White.....30¢ Albertson Mfg. Co.....25¢	Steel Yards.....40¢ Stocks and Dies— Blacksmith's Waterford Goods.....30¢ Butterfield's Goods.....30¢ Lightning Screw Plates.....25¢ Reese's New Screw Plates.....35¢ Stone— Hindustan No. 1, 3; Axe, 3; Slips No. 1, 4; 4¢ Sand Stone.....\$ b 24¢ Washita Stone, Extra.....\$ b 19¢ Washita Stone, No. 1.....\$ b 14¢ Washita Stone, No. 2.....\$ b 11¢ Washita Stone, No. 3.....\$ b 8¢ Washita Stone, No. 4.....\$ b 5¢ Washita Stone, No. 5.....\$ b 3¢ Arkansas Stone, No. 1, 4 to 6 in.....\$ b 1.50 Arkansas Stone, No. 1, 6 to 9 in.....\$ b 1.85 Turkey Oil Stone, 4 to 8 in.....\$ b 1.00 Lake Superior Slips, Chas.....\$ b 31¢ Seneca Stone, Red Paper Brand.....\$ b 18¢ Seneca Stone, High Rounds.....\$ b 18¢ Seneca Stone, Small Whets.....\$ b 18¢	Tinware— Stamped, Japaned and Pieced, list Jan. 20 1887.....75¢	Well Buckets, Galvanized— Hill's.....\$ doz \$4.25, 14 qt, \$5.25 Iron Clad.....\$ doz \$4.25, 14 qt, \$5.25 Whiting's Flat Iron Band.....\$ doz \$4.50 Whiting's Wired Top.....\$ doz \$4.00, 4.25
Shoes, Horse, Mule, &c.— Horse— Burden's, Perkins', Phoenix, at factory.....\$4.00 Mule— Add \$1 per keg to above prices. Oz. Wrought— Ton lots.....\$ b 9¢ 1000 b lots.....\$ b 9¢ 500 b lots.....\$ b 10¢	Staples— Fence Staples, Galvanized.....Same price Fence Staples, Plain.....as Br'd Wire See Trd. Rep.	Tire Benders, Upsetters, &c.— Stoddard's Lightning Tire Upsetters.....15¢ Detroit Perfected Tire Bender.....15¢	Well Wheels— 8 in., \$2.25; 10 in., \$2.70; 12 in., \$3.25
Shovel and Spades— Ames' Shovels, Spades, &c., list Nov. 1, 1885.....30¢ Norr's—Jobbers frequently give 5¢/4¢ extra on above Griffith's Black Iron.....50¢ Griffith's C. S.....60¢ Griffith's Solid C. S. R. Goods.....20¢ Old Colony (Sanford Fork & Tool Co.).....20¢ St. Louis Shovel Co.....20¢ Hussey, Binns & Co.....15¢ Hubbard & Co.....20¢ Lehigh Mfg. Co.....50¢ Payne Petebone & Son, list January, 1886.....30¢ Remington's (Lowman's Patent).....30¢ Rowland's, Black Iron.....50¢ Rowland's Steel.....60¢	Staples— Fence Staples, Galvanized.....Same price Fence Staples, Plain.....as Br'd Wire See Trd. Rep.	Tobacco Cutters— Champion.....20¢ Wood Bottom.....\$ doz \$5.00, \$5.25 All Iron.....\$ doz \$4.25 Neahua Lock Co's \$ doz, \$18.00 50¢ Wilson's.....55¢ Sargent's.....\$ doz \$24.55, 10¢ Acme.....\$ doz \$20.00, 40¢	Wire— Iron— Br. & Ann., Nos. 0 to 18.....70¢ Cop'd, Nos. 0 to 18.....70¢ Gal., Nos. 0 to 18.....55¢ Tin'd, Tinned list Nos. 0 to 18.....67¢ Stone Br. and Ann'd, Nos. 16 to 18, 75¢ Bright and Ann'd, Nos. 19 to 20, 75¢ Br. and Ann'd, Nos. 27 to 30, 75¢ Tinned.....70¢ Tinned Broom Wire.....70¢ Galvanized Fence.....55¢ Annealed Fence, Nos. 8 and 9.....75¢ Annealed Fence, Nos. 10 to 14.....75¢ Brass, list Jan. 18, 1884.....15¢ Copper, list Jan. 18, 1884.....15¢ Baco Fence.....See Trade Report Wire on Spools.....65¢ Mallin's Steel and Tin'd Wire on Spools.....40¢ Mallin's Brass and Cop. Wire on Spools.....30¢ Cast Steel Wire.....\$ doz \$0.00 to 2, 30¢ Steel Music Wire, Nos. 12 to 30, 55¢ Picture Wire.....New list, 50¢ Barb Wire Safety Guards.....\$ 1000, \$0.00, 25¢ Wire Clothes Lines, see Lines.
Shovels and Tongs— Iron Head.....60¢ Brass Head.....60¢	Staples— Fence Staples, Galvanized.....Same price Fence Staples, Plain.....as Br'd Wire See Trd. Rep.	Transom Lifters— Wollensak's: Class 3 and 4, Bronzed Iron.....50¢ Class 3 and 4, Bronze Metal.....25¢ Class 3 and 4, Brass.....35¢ Skylight Lifters.....35¢ Crown, Eagle and Shield.....50¢ Rether's, list Jan. 1, 1887.....50¢ Bronzed Iron Rods.....50¢ Brass, Real Bronze or Nickel Plate.....30¢ Excelsior.....50¢ Shaw's.....50¢ Payson's Universal.....40¢	Wire Cloth, Netting, &c.— Painted Screen Cloth, good quality.....\$ 100 sq. ft., \$1.50 to \$1.90 Galvanized Wire Netting.....75¢
Skeins, Thimble— Western list.....75¢ Columbus Wrt. Steel, list Nov. 1, 1887, 20¢ Coldbrookdale Iron Co.....50¢ Utica P. S. T. Skeins.....60¢ Utica Turned and Fitted.....35¢	Staples— Fence Staples, Galvanized.....Same price Fence Staples, Plain.....as Br'd Wire See Trd. Rep.	Traps— Game— Newhouse.....35¢ Onoda Patent.....40¢ Game, Blake's Patent.....40¢ Mouse and Rat— Mouse Wood, Choker, \$ doz holes, 11¢ Mouse, Round Wire.....\$ doz \$1.50, 10¢ Mouse, Cage Wire.....\$ doz \$2.50, 10¢ Mouse, Catch-em-alive.....\$ doz \$2.50, 15¢ Mouse, "Bonanza".....\$ gr \$10.00, net Mouse, Delusion.....\$ gr \$18.00, 15¢ Rat, "Decoy".....\$ gr \$10.00, 10¢ Ideal.....\$ gr \$10.00, 10¢ Cyclone.....\$ gr \$5.25 Hotchkiss Metallic Mouse, 5-hole traps.....\$ doz 9¢ In full cases.....\$ doz 75¢	Wire Goods— See Bright Wire Goods.
Sieves— Buffalo Metallic, S. S. & Co.....50¢ Barler Flour Sifters.....\$ doz \$2.00 Electric.....\$ gr \$21.60 Hunter's.....\$ gr \$18.00 Smith's Adjustable Sifters.....\$ doz \$2.00 Smith's Adjustable Milk Strainer.....\$ doz \$2.00 Smith's Adjustable T. & C. Strainer.....\$ doz \$1.25	Staples— Fence Staples, Galvanized.....Same price Fence Staples, Plain.....as Br'd Wire See Trd. Rep.	Traps— Butter and cheese.....25¢	Wire Rope— List May 1, 1886.....30¢ Cast Steel.....40¢
Slates— School, by case.....	Staples— Fence Staples, Galvanized.....Same price Fence Staples, Plain.....as Br'd Wire See Trd. Rep.	Trucks, Warehouse, &c.— B. & L. Block Co.'s list '82.....40¢	Wrenches— American Adjustable.....40¢ Baxter's Adjustable "S".....40¢ Baxter's Diagonal.....40¢ Coe's Genuine.....55¢ Coe's "Mechanics".....55¢ Girard Standard.....70¢ Machinists' Sterling Wrench Co.....70¢ Lamson & Sessions' Engineers.....60¢ Lamson & Sessions' Standard.....70¢ Goes' Pattern, Wrought.....80¢ Girard Agricultural.....80¢ Lamson & Sessions' Agriol.....80¢ Sterling Wrought.....80¢ Bemis & Call's Pat. Combination.....35¢ Merrick's Pattern.....35¢ Briggs' Pattern.....25¢ Cylinder or Gas Pipe.....40¢ No. 3 Pipe.....40¢ Aiken's Pocket (Bright).....\$6.00, 50¢ The Favorite Pocket.....\$ doz \$4.00, 40¢ Webster's Pat. Combination.....25¢ Boardman's.....30¢ Always Ready.....25¢ Aligator.....50¢ Donohue's Engineer.....20¢ Acme, Bright.....60¢ Acme, Nickel.....50¢ Walker's.....55¢ Diamond Steel.....55¢
Snaps, Harness, &c.— Anchor (T. & S. Mfg. Co.).....65¢ Pitch's (Bristol).....50¢ Hotchkiss.....10¢ Andrews.....50¢ Sargent's Patent Guarded.....70¢ German, new list.....40¢ Covert.....50¢ Covert, New Patent.....50¢ Covert, New R. E.....60¢ Covered Spring.....60¢	Staples— Fence Staples, Galvanized.....Same price Fence Staples, Plain.....as Br'd Wire See Trd. Rep.	Traps— Butter and cheese.....25¢	Wringers, Clothes— List March 11, 1889, 2¢ cash.
Spears, Harness, &c.— Anchor (T. & S. Mfg. Co.).....65¢ Pitch's (Bristol).....50¢ Hotchkiss.....10¢ Andrews.....50¢ Sargent's Patent Guarded.....70¢ German, new list.....40¢ Covert.....50¢ Covert, New Patent.....50¢ Covert, New R. E.....60¢ Covered Spring.....60¢	Staples— Fence Staples, Galvanized.....Same price Fence Staples, Plain.....as Br'd Wire See Trd. Rep.	Traps— Butter and cheese.....25¢	Wrought Goods— Staples, Hooks, &c., list Jan. 12, 1886, 30¢

CURRENT METAL PRICES.

MARCH 27, 1889.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market reports.

IRON AND STEEL.	
Bar Iron from Store.	
Common Iron:	
3/4 to 2 in. round and square.	\$ 1.90 @ ..
1 to 6 in. x 3/4 to 1 in.	\$ 2.00 @ 2.10
Refined Iron:	
3/4 to 2 in. round and square.	\$ 2.20 @ 2.30
1 to 4 in. x 3/4 to 1 1/4 in.	\$ 2.10 @ 2.20
4 1/2 to 6 in. x 3/4 to 1 in.	\$ 2.20 @ 2.30
1 to 6 in. x 1 1/4 and 5-16	\$ 2.30 @ 2.40
Rods—3/4 and 1-1/2 round and sq.	\$ 2.10 @ 2.20
Bands—1 to 6 x 3-16 to No. 12.	\$ 2.20 @ 2.30
"Burden Best" Iron, base price.	\$ 3.00 @ ..
Burden's "H. B. & S." Iron, base price.	\$ 2.80 @ ..
price.	\$ 3.10 @ ..
"Ulster"	\$ 4.00 @ 5.00
Norway Rods	

Merchant Steel from Store.	
Per pound.	
Open-Hearth and Bessemer Machinery, Toe Calk, Tire and Sleigh Shoe, base price in small lots.	2 1/4
Best Cast Steel, base price in small lots	5 1/4
Best Cast Steel Machinery, base price in small lots	5

Sheet Iron from Store.	
Common American. R. G. Cleaned.	
10 to 16.	\$ 2.75 @ 2.80
17 to 20.	\$ 2.85 @ 3.00
21 to 24.	\$ 3.00 @ 3.10
25 and 30.	\$ 3.20 @ 3.50
35.	\$ 3.35 @ 3.75
38.	\$ 3.50 @ 4.00
Galv'd, 14 to 20.	\$ 4.50 @ 4.88
Galv'd, 21 to 24.	\$ 4.87 1/2 @ 4.75
Galv'd, 25 to 28.	\$ 5.25 @ 5.12
Galv'd, 27.	\$ 5.63 1/2 @ 5.45
Galv'd, 28.	\$ 6.00 @ 5.85
Patent Planchet.	\$ 10 1/4 @ 10 1/2
Russia.	\$ 10 1/4 @ 10 1/2
American Cold Rolled B. B.	\$ 5 1/2 @ 7 1/2

English Steel from Store.	
Best Cast.	\$ 15
Extra Cast.	\$ 16 1/2
Swaged Cast.	\$ 16
Best Double Shear.	\$ 15
Bilster, 1st quality.	\$ 12 1/2
German Steel, Best.	\$ 10
2d quality.	\$ 9
3d quality.	\$ 8
Sheet Cast Steel, 1st quality.	\$ 15
2d quality.	\$ 14
3d quality.	\$ 13 1/2

METALS.	
Tin.	
Banca, Pigs.	28
Straits, Pigs.	23
English, Pigs.	23 1/4
Straits in Bars.	24

Tin Plates.	
Charcoal Plates.—Bright.	
Melny Grade.	Per box.
IC, 10 x 14.	\$5.75 @ \$6.00
IC, 12 x 12.	6.00 @ 6.25
IC, 14 x 20.	6.00 @ 6.25
IC, 20 x 28.	12.00 @ 12.50
IX, 10 x 14.	7.25 @ 7.50
IX, 12 x 12.	7.50 @ 7.75
IX, 14 x 20.	7.50 @ 7.75
IX, 20 x 28.	15.00 @ 15.50
DX, 12 1/2 x 17.	5.50 @ 5.75
DX, 14 1/2 x 17.	7.00 @ 7.25
Call and Grade.	
IC, 10 x 14.	6.00 @ 6.25
IC, 12 x 12.	6.00 @ 6.25
IC, 14 x 20.	6.00 @ 6.25
IX, 10 x 14.	7.25 @ 7.50
IX, 12 x 12.	7.50 @ 7.75
IX, 14 x 20.	7.50 @ 7.75
IX, 20 x 28.	15.00 @ 15.50
DX, 12 1/2 x 17.	5.50 @ 5.75
DX, 14 1/2 x 17.	7.00 @ 7.25
Allaway Grade.	
IC, 10 x 14.	5.00 @ 5.12 1/2
IC, 12 x 12.	5.12 1/2 @ 5.25
IC, 14 x 20.	5.00 @ 5.12 1/2
IX, 10 x 14.	6.00 @ 6.25
IX, 12 x 12.	6.25 @ 6.50
IX, 14 x 20.	6.00 @ 6.25
IX, 20 x 28.	12.00 @ 12.50
DX, 12 1/2 x 17.	4.75 @ 5.00
DX, 14 1/2 x 17.	5.75 @ 6.00

Coke Plates.—Bright.	
Steel Coke.—IC, 10 x 14, 14 x 20.	\$4.75 @ \$5.00
10 x 28.	7.25 @ 7.50
20 x 28.	9.75 @ 10.25
IX, 10 x 14, 14 x 20.	5.50 @ 5.75
20 x 28.	4.50 @ 4.80
Charcoal Plates.—Tenne.	
Deam Grade.—IC, 10 x 20.	\$4.40 @ \$4.62 1/2
14 x 20.	9.00 @ 9.25
IX, 14 x 20.	4.40 @ 4.62 1/2
20 x 28.	11.00 @ 11.37 1/2
Abecarn Grade.—IC, 14 x 20.	4.25 @ 4.50
20 x 28.	8.50 @ 9.00
IX, 14 x 20.	5.25 @ 5.50
20 x 28.	10.50 @ 10.80

Tin Boiler Plates.	
IX, 14 x 26.	112 sheets. \$12.50 @ \$12.75
IX, 14 x 28.	112 sheets. 12.75 @
IX, 14 x 31.	112 sheets. 14.25 @

Copper.	
Duty: Pig. Bar and Ingot, 4¢; Old Copper, 3¢	
\$ B. Manufactured (including all articles of which Copper is a component of chief value), 45 s. ad valorem.	

Ingot.	
Lake.	16 1/2 @ 17
"Anchor" Brand.	16 @

Prices adopted by the Association of Copper Manufacturers of the United States, December 10, 1887, being quotations for all sized lots.

Sheet and Bolt.	
Weights per square foot and prices per pound.	
Not wider than	Not longer than
Not longer than	And longer than
Over 64 oz.	Over 64 oz.
30	72
30	72
36	96
36	96
48	96
48	96
60	96
60	96
84	96
84	96
Over 84 in. wide	27

All Bath Tub Sheets.	16 oz. 14 oz. 12 oz. 10 oz.
Per pound.	\$0.53 0.80 0.82 0.85
Bolt Copper, 3/4 inch diameter and over, per pound.	25
Circles, 60 inches in diameter and less, 3 cents per pound advance over lowest prices of Sheet Copper of the same thickness.	
Circles, over 60 inches diameter, up to 96 inches diameter, inclusive, 5 cents per pound advance over lowest prices of Sheet Copper of the same thickness.	
Circles, over 96 inches diameter, 6 cents per pound advance over lowest prices of Sheet Copper of the same thickness.	
Segment and Pattern Sheets, 3 cents per pound advance over price of sheets required to cut them from.	
Cold or Hard Rolled Copper, 14 ounces per square foot and heavier, 1 cent per pound over the foregoing prices.	
Cold or Hard Rolled Copper, lighter than 14 ounces per square foot, 2 cents per pound over the foregoing prices.	

Copper Bottoms, Pits and Flats.	
Per pound.	
14 ounce to square foot and heavier.	26
12 ounce and up to 14 ounce to square foot.	29
10 ounce and up to 12 ounce.	31
Circles less than 8 inches diameter 2 cents per pound additional.	
Circles over 18 inches diameter are not classed as Copper Bottoms.	

Tinning.	
Tinning sheets on one side, 10, 12 and 14 x 48 each.	8
Tinning sheets on one side, 30 x 60 each.	30
For tinning boiler sizes, 9 in. (sheets 14 in. x 60 in.), each.	15
For tinning boiler sizes, 8 in. (sheets 14 in. x 56 in.), each.	12
For tinning boiler sizes, 7 in. (sheets 14 in. x 52 in.), each.	12
Tinning sheets on one side, other sizes, per square foot.	2 1/4
For tinning both sides double the above prices.	

Planished Copper.	
Planished Copper List May 5, 1888.	Net
Brass and Copper Tubes.	
Seamless Copper.	Seamless Brass.
3/8 inch \$ B.	50¢
1/2 " " "	44¢
3/4 " " "	42¢
1 " " "	40¢
1 1/4 " " "	38¢
1 3/4 " " "	37¢
2 " " "	34¢
2 1/2 " " "	34¢

Roll and Sheet Brass.	
Discount from list.	10 @ 15 %
High Brass Rods.	
Over 1 inch diameter.	27¢
3/4 inch to 1 inch diameter, both inclusive.	24¢
No. 8 and less than 3/4 inch diameter.	26¢
Smaller than No. 8.	30¢
Hexagon, Octagon and Square, 2¢ \$ B advance over Round Rods.	

Spelter.	
Duty: Pig. Bars and Plates, \$1.50 \$ B 100 lb.	
Western Spelter	5 1/4 @ 5 1/2
"Berg-Import"	5
"Bertha"	7 1/4 @ 8

Zinc.	
Duty: Sheet, 2 1/4¢ \$ B.	
600 lb casks	6 1/4
Per lb	7 1/4

Lead.	
Duty: Pig. \$2 \$ B 100 lb. Old Lead, 2¢ \$ B.	
Pipe and Sheets, 3¢ \$ B.	
American	4 1/4
Newark	4 1/4
Bar	4 1/4
Pipe, subject to trade discount.	6
Tin-Lined Pipe, subject to trade discount.	15
Block Tin Pipes, subject to trade discount.	45
Sheet, subject to trade discount.	6 1/4

Solder.	
1/2 @ 1/2 (Guaranteed)	15
Extra Wiping	12 1/4
The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.	

Antimony.	
Cookson	\$ B 13 1/4 @ 14
Hallett's	" 13

Plumbers' Brass Work.	
Dis. per cent.	
Ground Bibbs and Stops.	55 @ 10 1/2
Ground Stops, Hydrant Cocks, &c.	55 @ 10 1/2
Corporation Cocks.	55 @ 10 1/2
Corporation Cocks, "Mueller" Pattern, from Western list.	55 @ 10 1/2
Ground Basin and Shampooing Cocks.	50 @ 10 1/2
Compression Basin Cocks.	50 @ 10 1/2
Compression Basin and Sink Cocks.	50 @ 10 1/2
Compression Pantry Cocks.	50 @ 10 1/2
Compression Double Basin and Shampooing Cocks.	50 @ 10 1/2
Compression Double Bath Cocks.	50 @ 10 1/2
Compression Bibbs, Urinal Cocks, Sill Cocks, Stops, Hopper Cocks, Hydrant Cocks and Ball Cocks.	50 @ 10 1/2
Basin Plugs and Basin Grates.	55 @ 10 1/2
Bath and Wash Tray Plugs.	55 @ 10 1/2
Bath Wastes and Washers, Bath and Basin Valves, Sewer and Vacuum Valves, Cistern Valves, Pump Valves and Strainers, Ship Closet Valves and Suction Baskets.	55 @ 10 1/2
Basin Clamps, Basin Joints and Strainers.	55 @ 10 1/2
Boiler Couplings, Ground Face, per set \$1.25.	dis 10
Boiler Couplings, Plain Face, per set \$1.30.	dis 10
Water Back Valve and Plain Couplings, Soldering Nipples and Unions.	55 @ 10 1/2
Union Joints.	60 @ 10 1/2
Hydrant Nozzles, Handles and Guides, Sockets and Clamps, Street Washer Screws and Guides.	55 @ 10 1/2
Hose Goods.	55 @ 10 1/2

Steam and Gas Fitters' Brass and Iron Work.	
Discount per cent.	
Brass Globe Valves.	60 @ 10 1/2
Finished Brass Globe Valves, with Finished Brass Wheels.	40 @ 10 1/2
Brass Globe Valves, with Patent Wood Wheels.	60 @ 10 1/2
Brass Globe Angle and Corner Valves.	60 @ 10 1/2
Brass Radiator Angle Valves.	60 @ 10 1/2
Brass Radiator Angle Valves, Frink's Patent.	60 @ 10 1/2
Brass Cross and Check Valves.	60 @ 10 1/2
Brass Check Valves.	60 @ 10 1/2
Brass Hose Valves.	60 @ 10 1/2
Brass and Iron Frink Valves.	60 @ 10 1/2
Brass Safety Valves.	60 @ 10 1/2
Brass Vacuum Valves.	60 @ 10 1/2
Brass Whistle Valves.	60 @ 10 1/2
Brass Balance, Back Pressure and Foot Valves.	60 @ 10 1/2
Brass Butterfly and Throttle Valves.	50 @ 10 1/2
Brass Pump Valves.	50 @ 10 1/2
Brass Steam Cocks.	67 1/2 @ 10 1/2
Brass Service, Meter and Union Meter Cocks.	57 1/2 @ 10 1/2
Brass Whistles, Water Gauges & Oil Cups.	60 @ 10 1/2
Brass Hollow Plug, Tallow and Globe Oil Cups.	50 @ 10 1/2
Brass Lubricators.	60 @ 10 1/2
Brass Air Valves.	60 @ 10 1/2
Brass Air Cocks.	60 @ 10 1/2
Brass Gauge Cocks.	55 @ 10 1/2
Brass Cylinder Cocks and Steam Bibbs.	50 @ 10 1/2
Brass Swing Joints and Expansion Joints.	50 @ 10 1/2
Brass Test Pumps.	60 @ 10 1/2
Brass Steam Fittings, Rough.	60 @ 10 1/2
Brass Steam Fittings, Finished.	60 @ 10 1/2
Brass Union Joints.	60 @ 10 1/2
Brass Soldering Unions and Nipples.	55 @ 10 1/2
Brass Hose Fittings, Fusible and Boiler Plugs.	55 @ 10 1/2
Iron Body Globe, Angle, Cross and Check Valves.	55 @ 10 1/2
Iron Body Safety, Throttle, Back Pressure, Butterfly and Foot Valves.	55 @ 10 1/2
Iron Cocks, all Iron.	55 @ 10 1/2
All Iron Valves.	55 @ 10 1/2

Miscellaneous.	
Discount per cent.	
Cast Iron Fittings.	70 @ 10
Plugs and Bushings.	75 @ 10
Malleable Iron Unions.	67 1/2
Malleable Iron Fittings.	25

Paints.	
Black, Lamp—Coach Painters.	\$ B 22 @ 24
Ordinary.	6
Black, Ivory Drop, fair.	12 @ 15
best.	28
Black Paint, in oil, kegs, 8¢; assorted cans, 11¢	
Blue, Prussian, fair to best.	40 @ 55
" " in oil.	45 @ 55
" Chinese dry	70
" Ultramarine.	18 @ 30
Brown, Spanish.	14
" Van Dyke.	10 @ 12 1/2
Dryers, Patent American, ass'd cans, 9¢; kegs, 7¢	
Green, Chrome	15 @ 25
Green, Chrome in oil.	14 @ 18 @ 25
Green, Paris	good, 20¢; best, 25¢
Green, Paris in oil	good, 20¢; best, 25¢
Iron, ant. Bright Red.	\$ B 24
Iron Paint, Brown.	\$ B 14
Iron Paint, Purple.	\$ B 34
Iron Paint, Ground in oil, Bright Red.	\$ B 64
Iron Paint, Ground in oil, Red.	\$ B 54
Iron Paint, Gr. und in oil, Brown.	\$ B 54
Iron Paint, Ground, Purple.	\$ B 6
Litharge.	6 1/4
Mineral Paints	2 @ 4
Orange Mineral	10
Red Lead, American.	6 1/4
Red Venetian (Eng.) dry.	\$1.65 @ \$1.70
Red Venetian in oil.	ass'd cans, 11¢; kegs, 8¢
Red Indian Dry.	9 @ 12
Rose Pink.	10 @